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The effects of social setting and portion size on food consumption amount.

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**The Effects of Social Setting and Portion Size
on Food Consumption Amount**

Presented by

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ABSTRACT

How much food a person eats has always been explained by an individual's hunger and satiety level. Before scholars first discovered that non-physiological factors would better predict the amount of food a person will consume, physiological cues were the primary explanation as to how much a person consumed (Schachter, Goldman, & Gordon, 1968; Stunkard & Koch, 1964). The existing literature shows that consumers' food consumption behaviours are influenced by a number of distinctive contextual cues. These cues can be divided into personal contextual cues, consumption contextual cues and food contextual cues. Among these contextual effects, social setting and portion size are identified as two of the most important contextual cues. Given that individuals often look for norms of appropriateness from these contextual cues in eating events (Herman & Polivy, 2005) and that individuals are always studied separately, the current research aims to examine the combined effect of portion size and social setting. In addition to this, the current research aims to examine social visibility and other personal contextual cues as the possible moderators of the portion size effect, the social effect and the combined effect of portion size and social setting.

A quasi-natural research design was used in both of the experimental studies to manipulate the contextual cues that are of interest and to keep the other contextual cues constant. The findings from these two studies showed that consumers respond differently to the effect of portion size in different social settings. That is, the increased amount of food consumed by individuals due to a larger portion size differs when individuals are eating alone or eating in a group. In addition to that, the relationship between the effects of portion size and social setting is qualified by social visibility. When the social visibility is high, the portion size effect is moderated by the social setting. However, when the social visibility is low, social norms set by eating partners become vague and the effect of portion size and social setting become additive.

The existing literature reports the social setting having opposing effects on food consumption and the distinctive areas of the social effect literature have prevented practical implications from being derived from the existing knowledge of the social effect. The findings in the current research advanced the existing knowledge of the social effect and contributed to improving the understanding of the practical implications of social effect. When the social visibility is high, social modelling is found among consumers eating in a group. However, consumers tend to reduce their consumption when they are eating in a group regardless of the social visibility. These

findings were obtained from a series of experimental sessions where the eating duration in every experimental session was kept constant at five minutes. The current research concludes that social modelling coexists with social suppression (i.e. impression management) when consumers are eating in a social setting given that the eating duration is not overly long.

Social visibility plays an important role in contextual effects. The influences of social norms prevail when the social visibility is high; consequently, consumers are less influenced by other contextual effects, such as the effect of portion size, self-esteem and restraint, than the social effect. However, when the social visibility is low, the consumption cues originating from the social norms set by eating partners become vague. The results of this study show portion size, self-esteem and restraint have strong influences on the amount consumed by consumers. Therefore, consumers who are eating in a group when the social visibility is low are influenced by the effect of portion size, self-esteem, and restraint as well as the social setting. In addition to this, the effect of portion size is moderated by consumers' self-esteem and restraint level when the social visibility is low but not when the social visibility is high. This is due to the weakened social effect caused by vague social norms in low social visibility conditions. When consumers are eating from a small portion in low social visibility condition, consumers with low self-esteem and consumers who are more restrained consume more food. While self-esteem moderates the effect of the social setting when the social norm is vague due to low social visibility, restraint moderates the effect of the social setting regardless of the social visibility. This shows that restrained consumers are less influenced by the social effect.

Importantly, these findings provide evidence for theoretical discussions and new research avenues. The portion size effect has been shown to be robust and methods such as educating consumers about the adverse risk of portion size failed to reduce the negative consequences of the portion size effect. The current research shows that the portion size effect is moderated by the social setting in high social visibility conditions. Therefore, one of the largest theoretical implications of the current research is the finding of the possibility of reducing the adverse effect of the portion size through social eating. Another important theoretical contribution is the finding of the prevalence of the social effect over the portion size effect and that the effect of social setting is moderated by social visibility. Collectively, these have contributed to addressing the existing knowledge gap and enabled the theoretical implications of current findings. These important findings could make a large contribution to the food industry, where food manufacturers can continue to reap the benefits of large portion size offerings while reducing the

general well-being drawbacks to consumers through the identified moderators. Not only would this reduce the negative reputation that food marketing currently has, social marketers and public policy makers can also use these findings to promote a healthier lifestyle to consumers.

Ethics Declaration

The research associated with this thesis abides by the international and Australian codes on human and animal experimentation, the guidelines by the Australian Government's Office of the Gene Technology Regulator and the rulings of the Safety, Ethics and Institutional Biosafety Committees of the University.

Publications During Candidature

Tan, M. C. T., Dubelaar, C., & Zlatevska, N. (2015). The effects of social setting and portion size on food consumption amount. *Asia-Pacific Advances in Consumer Research*, Hong Kong. 264-265.

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Keywords

Portion size effect, social effect, social visibility, food consumption behaviour, contextual effects

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1.0 INTRODUCTION

1.1 Research Background

There are a number of factors that affect how much food consumers consume. In the past, hunger and satiety level were considered to be the primary explanations for the amount a person consumes (Vartanian, Herman, & Wansink, 2008). However, in the 1960s, scholars first discovered that non-physiological factors better predict the amount of food that a person will consume (Schachter et al., 1968; Stunkard & Koch, 1964). Non-physiological factors include but are not limited to the portion size effect (e.g. Zlatevska, Dubelaar, & Holden, 2014), social influences, social norms (e.g. Herman & Polivy, 2005) and marketing communication (e.g. Levitsky & Pacanowski, 2012). These factors are called contextual cues.

Research shows that consumers make more than 200 food-related decisions in a day; however, consumers underestimate the number of their daily food-related decisions they make by an average of 221 (Wansink & Sobal, 2007). A large number of these food-related decisions are influenced by different contextual cues (e.g. Wansink, 2004). However, Wansink and Sobal (2007) discovered that with consumers who increased their consumption due to contextual cue stimuli, only 4 per cent attributed their consumption increase to the cue. Using a wide range of subjects from all walks of life and in different ages, Wansink and Sobal investigated the effects of package size, serving bowl size, and plate size by randomly allocating subjects to treatment (doubling the size) and control conditions. Every participant in the treatment condition was asked with two same questions: (i) “How much did you eat compared to what is typical for you?” (ii) “In this study, you were in a group that was given [a larger bowl]. Those people in your group ate an average of 20%-50% more than those who were instead given [a smaller bowl]. Why do you think you might have eaten more?”. Of the remainder, 75 per cent of the respondents

explained the increase with other reasons, such as hunger, while the remaining 21 per cent of respondents denied that they had increased their consumption at all. Increased food consumption is one of the leading causes of obesity (Levitsky & Pacanowski, 2012), which is related to poor health outcomes. Therefore, understanding the contextual effects that affect the amount consumers eat is an important area of research.

Making good food-related decisions and maintaining a healthy diet is a challenge for consumers who are not aware how the various contextual cues influence their eating (e.g. Vartanian *et al.*, 2008). Given consumers' frequent underestimation or unawareness of contextual cues and the possible prolonged negative health and well-being consequences of making poor food choices (e.g. Vartanian *et al.*, 2008), the current research focuses on the effects arising from these contextual cues. It is important to note that food-related decisions can be decisions made about either food choices or the food consumption amount. Decisions made concerning the choices of food determine *what* an individual eats, while decisions made on food consumption amount determine *how much* an individual eats (Wansink, 2004; Wansink, Just, & Payne, 2009). The current research focuses on the effects of two contextual cues that influence consumers' behaviour on the food consumption amount (the portion size and social influence effects). Therefore, in this thesis 'food consumption behaviour' refers only to the amount consumed by the consumer, unless otherwise specified.

As discussed in the previous paragraph, the existing literature shows that consumers' decisions about their food consumption amount are influenced by a number of distinctive contextual cues (e.g. Wansink, 2004). These contextual cues can be divided into personal contextual cues, consumption contextual cues and food contextual cues. Personal contextual cues include mood (Patel & Schlundt, 2001); hunger or satiation (Bellisle, Dalix, & de Castro, 1999; de Castro & de Castro, 1989; de Castro, 1990; Feunekes, de Graaf, & Van Staveren, 1995; Goldman, Herman,

& Polivy, 1991; Hermans, Herman, Larsen, & Engels, 2010a); gender (Berry, Beatty, & Klesges, 1985; Conger, Conger, Costanzo, Wright, & Matter, 1980; Grunberg & Straub, 1992; Klesges, Bartsch, Norwood, Kautznan, & Haugrud, 1984; Krantz, 1979; P. Pliner, Bell, Hirsch, & Kinchla, 2006; Rolls, Morris, & Roe, 2002); cultural influences (Nicolaou *et al.*, 2009); body mass index (Edelman, Engell, Bronstein, & Hirsch, 1986; Klesges *et al.*, 1984; Romero, Epstein, & Salvy, 2009); and restrained eating (Hermans, Larsen, Herman, & Engels, 2012). Although non-physiological cues better predict the amount consumed by consumers than personal contextual cues such as hunger or satiation, hunger is still a significant explanatory theory for the consumption behaviour of consumers. However, hunger has been shown to have a weaker contextual effect when compared to other contextual cues (see Schachter *et al.*, 1968; Stunkard & Koch, 1964).

Consumption contextual cues refer to ambient factors that are related to food consumption but are not related directly to the food itself. They include distractions such as watching television while eating (Bevelander, Meiselman, Anschütz, & Engels, 2012; Hetherington, Anderson, Norton, & Newson, 2006); social interactions that take place while eating (Clendenen, Herman, & Polivy, 1994; de Castro, 1994; Hetherington *et al.*, 2006; Klesges *et al.*, 1984; Patel & Schlundt, 2001; P. Pliner *et al.*, 2006; Redd & de Castro, 1992); meal duration (Brindal, Wilson, Mohr, & Wittert, 2011; Hetherington *et al.*, 2006; P. Pliner *et al.*, 2006); the time of day (Bellisle *et al.*, 1999; Klesges *et al.*, 1984); and the ease of access to the food (Wansink, 2004).

Lastly, food contextual cues refer to factors that are directly associated with how food is presented. The food contextual cues that influence food consumption amount include portion size (Chandon & Wansink, 2007; Hermans *et al.*, 2012; Klesges *et al.*, 1984); package size (Chandon & Ordabayeva, 2009; Scott, Nowlis, Mandel, & Morales, 2008; Wansink, Geier, & Rozin, 2009; Wansink, 2004; Wansink & Kim, 2005; Wansink, Payne, & Shimizu, 2011); serving bowl size

(Wansink, Van Ittersum, & Painter, 2006); utensil size (Mishra, Mishra, & Masters, 2012; Wansink et al., 2006); plate size (van Ittersum & Wansink, 2012); and portion size (Scott *et al.*, 2008). As a brief summary of these varied types of contextual cues, Table 1 below outlines the differences between distinctive contextual cues.

Table 1: Summary of different types of contextual cues

Contextual Cue Type	Personal	Consumption	Food
Description	Individuals' characteristics	Ambient factors of food consumption that are not directly related to food itself	Factors that are directly associated with how food is presented

Each type of contextual cue can have both direct and indirect effects on the amount of food consumed (Wansink, 2004, p. 457). The indirect effects of these contextual cues influence the amount consumed either through the suggestion of appropriate consumption norms or through the inhibited ability to monitor one's consumption amount. In other words, the consumption context, such as dining with a friend, can have both direct and indirect impacts on an individual's consumption behaviour. Dining with a friend can directly impact the amount consumed by an individual through its effect on the meal duration (usually by extending it). Dining with a friend can also have an indirect impact due to the consumption norms set by the friend (such as eating everything on the plate or not ordering a dessert) or the reduced consumption self-monitoring accuracy as a result of the distraction caused by the interaction with the friend. Among these contextual cues, portion size (e.g. Levitsky & Pacanowski, 2012) and social setting (e.g. Herman, Roth, & Polivy, 2003) were found to be some of the strongest cues that influence the amount consumers would eat. Therefore, the current research focuses on these two contextual effects.

Portion size has been identified as one of the key factors causing obesity by marketing scholars, nutrition scholars and government agencies (e.g. Centers for Disease Control and Prevention, 2004; Chandon & Wansink, 2011; Levitsky & Pacanowski, 2012; Rolls, 2003; Steenhuis & Vermeer, 2009; Young & Nestle, 2002). Moreover, research shows that obesity has increased worldwide (Caballero, 2007; National Center for Health Statistics, 2008), with obesity commonly referred to as an epidemic, one that is now receiving serious attention globally (Levitsky & Pacanowski, 2012; Moore, 2007; World Health Organisation, 2003; World Health Organisation, 2014). Although there are very limited proofs showing the connection between increasing portion size and obesity (Herman, Polivy, Vartanian, & Pliner, 2016), research shows that how much a person eats depends largely on the portion size being served (e.g. Diliberti, Bordi, Conklin, Roe, & Rolls, 2004; Jeffery et al., 2007; Levitsky & Youn, 2004; Rolls et al., 2002). Therefore, examining the strong link between portion size and consumers' well-being is a significant and urgent task.

Health issues that are related to portion size are now a major concern. In 2012, the New York City Board of Health approved New York City Mayor Michael Bloomberg's proposal to ban the sale of sugary drinks larger than 16 oz (473ml) (Saul, 2012). However, because this ban exceeded the Board's powers, the enacted law was eventually overturned in the New York Supreme Court (Hughes, 2013) and the New York Court of Appeals (Volokh, 2014). Despite the law to restrict the sale of large-sized soft drinks being overturned, portion size is still regarded as a problem by social marketers and public health authorities (Zlatevska *et al.*, 2014). The attempt to restrict the sale of large sugary drinks demonstrates that portion size is a matter of concern for the New York City Board of Health and the New York City mayor and shows how both social marketers and public health authorities have responded to the perceived threat of the portion size effect.

Another reason portion size is a key concern for consumers' well-being is the increasing food portion sizes being offered to consumers. Over the past few decades, food portion sizes have increased dramatically (e.g. Nielsen & Popkin, 2003; Steenhuis & Vermeer, 2009). Using collections of painted art to study food portion sizes over a period of time, Wansink and Wansink (2010) examined the painted meals of Jesus Christ's Last Supper. They found that portion size has been increasing over the past millennium. The study used painted meals of Jesus Christ's Last Supper as Varriano (2008) suggests that Jesus Christ's Last Supper is the most common artistic depiction of a meal. Given that the growth in portion sizes in society in general is now well documented (e.g. Young & Nestle, 2002), this phenomenon seems increasingly embedded and on the rise worldwide (see Nielsen & Popkin, 2003). A simple explanation for this phenomenon may lie in the rise of globalisation and multinational food corporations who are motivated primarily by profits. Products offering larger portion sizes generate more profit for businesses and are favoured by customers as offering better value for money (Dobson & Gerstner, 2010). Within a wide range of industries, especially food and beverages, both consumer preferences and marketing efforts are largely characterised by promoting the advantages of larger portion size offerings (Dubois, Rucker, & Galinsky, 2012). Among many other examples in the industry are some of the leading brands such as McDonald's, Hershey's, Coca-Cola and Starbucks. The serving size changes made by these leading brands over decades are outlined in the following paragraph.

When McDonald's first started selling French fries in 1955, 2.4 oz (68g) was the only size of serving available for consumers. In 2002, McDonald's served their fries in different sizes, ranging from small (2.4 oz or 68g), medium (5.3 oz or 150g), large (6.3 oz or 180g) to supersize (7.1 oz or 200g). It is interesting to note that the original size is now labelled as "small". This suggests that it is less than the amount you would be expected to consume. Similarly, Hershey's

milk chocolate bar was only offered in a single size (0.6 oz or 17g) when it was first introduced in 1908. Packages of Hershey's milk chocolate bars with different sizes became available to consumers in 2002. From 2002 onwards, the smallest offering of Hershey's milk chocolate bar began with 1.6 oz (45g) – nearly triple the original – and is followed by multiple options of different sizes: 2.6 oz (74g), 4.0 oz (113g), 7.0 oz (198g) and 8.0 oz (227g). This phenomenon is also seen in the beverage industry. The original size of 192ml (6.5 oz) Coca-Cola single serve bottles increased to 300ml (about 10 oz – an increase of over 50 per cent), 500ml (about 16 oz) and 600ml (about 20 oz) modern, single serve bottles. Coca-Cola has recently reintroduced a smaller size serve of 200ml, but this is still just getting back to the original size. Starbucks originally served their coffee with a single size, tall (12 oz or 355ml), then they began to offer a range of sizes including grande (16 oz or 473ml), venti (20 oz or 591ml) and trenta (31 oz or 917ml). Note that none of these common examples are new serves that are smaller than the originals; all are larger. Arguably, this is reflective of the trend direction for food portions in society (e.g. Young & Nestle, 2002).

Capitalising on the advantages of economies of scale and the mix of fixed versus variable costs, products can be offered in larger portion sizes with a minimal cost increment. This idea of super-sizing originated in a cinema in Chicago in 1967, when David Wallerstein wanted to boost the sales of popcorn to help augment the thin profits from the low-margin sales of movie tickets. Since consumers did not purchase extra boxes of popcorn as it would be seen as overconsumption, Wallerstein introduced larger sized popcorn portions that could be priced higher but with minimal extra cost (Critser, 2003). The sales of popcorn increased and the concept was replicated in McDonald's fast food restaurants. Eventually, offering larger sizes at a seemingly reduced cost per unit was widely adopted by marketers in the food and beverage industry as a means to optimise the profitability and product competitiveness of their offerings (Dobson & Gerstner, 2010; Elliott, 1993). Having these larger portions available causes the

portion size effect discussed in the literature (Zlatevska *et al.*, 2014), where people eat more food when given a larger portion. The research findings on the effect of portion size are consistent (e.g. Chandon & Wansink, 2012; Wansink, 2004; Zlatevska *et al.*, 2014) and robust (Zlatevska *et al.*, 2014); consumers increase their consumption amounts with increases in portion sizes. This has become a health concern and marketers are now under increasing pressure to justify the effect of the portion sizes they are offering (e.g. Dobson & Gerstner, 2010; Elliott, 1993; Haws & Winterich, 2013; National Alliance for Nutrition and Activity, 2002). This concern was brought to public attention in the 2004 American documentary film *Supersize Me*, where Morgan Spurlock showcased how marketers use the notion of value to encourage consumers to purchase larger sizes. This notion of value is an interesting one as it implies a “win-win” outcome. Consumers pay less per unit for the product they purchase and companies make more profit on their sales, so everyone seems to win, at least until the effects of portion size are reflected in both weight gain and general health (Zlatevska *et al.*, 2014). In summary, the portion size effect and economies of scale can be employed in the industry with great financial benefits, but should not be done at the cost of the consumers’ general well-being.

While it is clear that portion size has a significant impact on the amount of food consumed, most portion size research is conducted with the participants eating alone or in the presence of a confederate who attempts to influence consumption (e.g. Hermans *et al.*, 2012). However, according to Hermans *et al.* (2012a) and Rozin (2005), the majority of eating events are held in a social setting. Therefore, food and food consumption should be generally analysed in a social context (e.g. Hermans, 2013). The amount an individual consumes has been found to be influenced by the social effect (see Herman *et al.*, 2003). The social effect refers to the variation in the amount consumed by individuals due to the presence of others during an eating event. Despite the profound impact of portion size reported in the literature, Herman and colleagues (2003, p. 883) suggest that the influences of social effects are more profound than any of the

other factors that influence food consumption. Moreover, the importance of the social effect is evident in the marketing activities of the food industry. According to Hirsch and Kramer (1993), large budgets have been allocated for marketing and advertising promotional strategies that focus on the social influences within the food industry. Therefore, the current study also emphasises that social influence is an important contextual cue of food consumption behaviour.

Hermans (2013) cites the importance of food consumption in a social context and argues that the image of a person can be reflected through his or her consumption behaviour. Given that individuals tend to portray a positive image of themselves and respond in a socially desirable manner (e.g. Fisher, 1993; e.g. Paulhus, 1984), the importance of social setting on food consumption behaviour is further justified. However, the reported effect of this important contextual cue in the extant literature is not consistent, as it has been found that eating in a group can have both facilitating and suppressing effects. There are several distinct areas of social study on food consumption amount (see Herman *et al.*, 2003). John de Castro (1989) is the most commonly known researcher in social facilitation studies. Through a series of studies that required participants to keep a diary of everything they ate in seven days, John de Castro and his colleagues demonstrated that eating in a group can increase food intake. However, de Castro (1990) also suggests that this effect may well be due to time extension; that is, that people spend more time eating when they eat in a group. de Castro's time-extension hypothesis has been agreed (e.g. P. Pliner *et al.*, 2006) or disagreed (e.g. Brindal *et al.*, 2011) by different studies. Building on the issues surrounding time-extension hypothesis, Herman (2015) proposed three propositions that are supported by empirical findings to explain the mechanism of social facilitation. Those three propositions include (i) larger intake when eating with others as social meals are generally longer, more pleasant, and less responsive to satiety signal, (ii) larger intake when eating with friends and family compared to strangers as individuals are less concerned with avoiding eating excessively that could convey bad impression, (iii) larger intake when eating in a larger group

due to higher tendency in over-ordering and different consumption norms. In contrast to the findings in social facilitation studies, Herman *et al.* (2003, p. 874) reviewed the literature and found that a number of studies show a reduction in consumption when eating in the presence of other individual(s), which they call ‘impression management’ (p.881). Herman *et al.* categorise the existing literature on the social effect of consumption into three distinctive areas of research: social facilitation, social modelling and impression management. Compared to individuals eating alone, subjects in the above-mentioned three distinct areas of the literature either consumed more or consumed less when eating with other individuals, depending on different circumstances.

In summary, the portion size effect is viewed as being both very strong and widespread. However, there are still many questions about whether the effect of portion size can be influenced by other contextual cues (Zlatevska *et al.*, 2014). It is clear that people tend to eat more when they are served larger portions, particularly when portion sizes are adjusted. In contrast, it is less clear what effect eating with others has on the amount consumed, even when portion sizes are adjusted. Although social effects were found to have a profound impact on consumption amount, studies have reported individuals consuming both more and less as a result of eating in a group. Additionally, portion size and social setting are some of the most common contextual cues that can jointly affect individuals’ consumption amount. Although the influences of both of these contextual cues have been widely explored in the existing literature, they have only just begun to be studied together (see Hermans *et al.*, 2012). Therefore, the current research aims to bring these two streams together to better understand how they jointly affect the amount an individual is likely to consume.

Social eating can change how much people eat, positively or negatively (Herman *et al.*, 2003, p. 874) and thus it is unclear whether it is possible that, if the time is controlled, people will respond differently to an increase in portion size in the presence of others as compared to when they are

alone. It is possible that the social facilitation effect may result in sufficient distraction (Hetherington *et al.*, 2006) to reduce individuals' attention to their consumption. In other words, the portion-induced increase in consumption may or may not be greater in the social setting than in the solo eating setting. On the contrary, Herman *et al.* (2003, p. 874) also point out that under some circumstances people will eat less in a social setting due to concerns about social image. This impression management could result in people restricting their intake to avoid sending adverse signals to their eating partners. This could mean that social eaters may respond less to increases in portion size than those eating alone. Given the lack of clarity in the literature, this thesis will explore the relationships between these two major influences on food consumption.

The social effect has always been explained as individuals' consumption being influenced by social norms (e.g. Herman *et al.*, 2003). Leone *et al.* (2007) manipulated the ambiguity of the social norm (ambiguous norm vs. clear norm) and found that individuals tend to consume per their own desire when the social norms are vague. Therefore, it would then follow that the extent to which individuals' consumption amounts are influenced by social norms depends on the visibility level of the norm being set, either by society or by other individuals in the eating event. This notion is further supported by the famous quote of Stephen Fry, "You are who you are when nobody's watching" (Friedkin, 2006). Due to the relationship between social visibility (the visibility level of the amount of the eating partner's consumption) and the social effect, the current research aims to study if social visibility affects the relationship between portion size effect and social effect. The research problems to be investigated in this study are outlined in the following section, Section 1.2.

1.2 Research Questions

As discussed above, the relationship between the portion size effect and the social effect has not been well explored in the existing literature. Only one study (see Hermans *et al.*, 2012) explores the relationship between social effect and portion size effect in an eating event. However, the social effect Hermans *et al.* examined in their study was the effect of the varied amount consumed by an eating partner. In contrast, instead of manipulating the eating partners' consumption amount, the social effect examined in the current study focuses on the presence or absence of eating partners. In light of the discussion above, the following research questions have been identified.

Research Question 1: Will consumers respond differently to an increase in portion size in the presence of others than when they are alone?

The first research question aims to investigate the relationship between the portion size effect and the social effect on the amount an individual consumes. The portion size effect and social effect are identified as some of the most important contextual cues that influence individuals' consumption behaviour (Herman & Polivy, 2005; Zlatevska *et al.*, 2014). Despite the profound impact of portion size, as reported in the literature, Herman and colleagues (2003, p. 883) suggest that the influence of the social effects is more substantial than any of the other factors that influence food consumption. However, it would seem essential that for a social effect to have an influence, a person's consumption behaviour must be visible or they must be able to observe their eating partners' consumption behaviour (social visibility). If both of these conditions are not met, then it would seem logical that the social effect should disappear. On top of this, the portion size effect is widespread (Zlatevska *et al.*, 2014) and people often consume food in the presence of others (Rozin, 2005). These two crucial contextual cues coexist in many of the eating events in

everyday life. In order to examine the simultaneous effects of these two stimuli, the amounts consumed by participants across eight experimental conditions with the manipulation of the portion size and the social setting were compared.

Research Question 2: Does social visibility have an impact on the relationship between the effect of portion size and social setting?

Following the first research question, the current research aims to investigate if the level of the visibility of consumption behaviour influences the social effect and the relationship between the portion size and the social effect. The concept of social norms is crucial in explaining the effect of social eating (P. Pliner & Mann, 2004; Roth, Herman, Polivy, & Pliner, 2001). However, whether it is the influence of visible levels of consumption behaviour that determine the extent to which individuals are affected by social norms (see Friedkin, 2006) has not been explored in the literature of food consumption. Therefore, the current research aims to investigate whether the social effect and the relationship between portion size and social effects is moderated by social visible levels of consumption behaviour.

Research Question 3: Will individuals consume more or less when eating with other individuals given the known context effects being controlled?

The current research also aims to extend existing understanding of social influence and its intricacies. In the existing literature, it is unclear as to what effect eating with others has on the amount consumed. Conflicting studies have shown that people consume both more and less as a result of eating in a group. Therefore, the current research aims to study the effect of social eating when the eating duration and portion size is controlled through experimental settings and with *ad libitum* eating experiences. de Castro (1990) suggests that social facilitation is due to time

extension (spending more time eating when in a group), while Herman and colleagues (2003) explain the social facilitation effect using the ‘inhibitory norm.’ The current research aims to examine if the social facilitation effect will be detected when eating duration is controlled across all experimental conditions.

Research Question 4: Will the amounts consumed by individuals correlate to the amounts consumed by other individuals in the same eating event?

Eating in a social setting was found to both facilitate and suppress the amount consumed by individuals, depending on the circumstances. In addition to the facilitation and suppression effects, the social modelling literature in food consumption research shows that individuals adjust their consumption amount according to the amount consumed by the confederate. Therefore, the current research aims to investigate if social modelling coexists with either the facilitation effect (social facilitation) or the suppression effect (impression management) when consumers are eating in a social setting.

Research Question 5: Will personal characteristics influence the effect of portion size and social setting?

Research Question 5a: Will the influence of portion size be affected by individuals’ restrained eating levels?

Research Question 5b: Will the influence of social setting be affected by individuals’ restrained eating levels?

Research Question 5c: Will the influence of portion size be affected by individuals’ self-esteem levels?

Research Question 5d: Will the influence of social setting be affected by individuals’ self-esteem levels?

Research Question 5 and its sub-questions examine whether other contextual cues influence portion size effect, social effect and the relationship between portion size and social effects. There are various contextual cues that may influence the amount of food an individual would consume. Food contextual cues and consumption contextual cues are external, while personal contextual cues are internal. The current study manipulates one food contextual cue (portion size) and two consumption contextual cues (social setting and visibility) while keeping all others constant. Personal contextual cues are not manipulated and cannot be controlled; hence, participants' personal contextual cues will be measured and examined to ascertain if they have an effect on the contextual cues being studied.

1.3 Significance of Study

The negative consequences of the portion size effect currently pose great challenges for both consumers and marketers. Neither educating consumers about portion size effect nor practising mindful eating has been found to be effective in reducing the effect of portion size (e.g. Cavanagh, Vartanian, Herman, & Polivy, 2014; Marchiori & Papies, 2014). Given the large impact that portion size has on consumers' general well-being (e.g. Chandon & Wansink, 2011; Young & Nestle, 2002) and that no effective way has been found to reduce the effect of portion size, identifying possible moderators of portion size effect is a matter of some social urgency. Therefore, the findings of the current study aim to address the existing research gaps of this important and highly influential effect.

The portion size and social effects are recognised as some of the most important contextual cues in the existing literature. Both of these contextual cues were identified to have large impacts on individuals' food consumption behaviour. However, the relationships between such important

contextual cues remain unknown. The findings in this study will extend the knowledge of the portion size and social effects by examining the relationship between them. The knowledge about the relationship between these two important contextual cues will provide an important contribution towards the promotion of healthy eating lifestyles. In addition, marketers can use these findings to further enhance the image of their brands by informing consumers of possible ways to avoid the negative consequences of such effects. Marketers are now under great pressure to justify the large portion sizes they are offering (e.g. Zlatevska, Dubelaar, & Holden, 2012). By acknowledging the negative consequences of the portion size effect and informing consumers about the ways to avoid them, marketers can therefore keep their products competitive in the market while consumers continue to benefit from the financial advantages of larger portion sizes.

Even though social setting has a strong impact on the amount consumed by individuals and has been reported in a plethora of studies (Herman *et al.*, 2003), the bidirectionality of this effect requires more investigation. Consumers are found to inconsistently consume both more and less when eating with other individuals compared to eating alone. It is crucial to bridge this knowledge gap, since not knowing the exact effect of such an important influence signifies that our knowledge of the social effect remains clouded. Without knowing whether the social setting facilitates or suppresses consumption, no significant implications can be derived from the findings on social setting. Therefore, closing this extant research gap contributes greatly to the implications of the social effect which has already been widely reported.

The manipulation of social visibility achieved through the use of two types of food with different sizes in the research design extends the current knowledge on the social effect. Social effect has always been explained by social norms (Herman *et al.*, 2003); however, social norms are highly dependent on visibility. Given that social visibility has not been tested in the extant literature, the current study aims to extend the current findings on the social effect by examining how social

visibility affects the impact of social setting, what influence it has on the amount consumed by individuals and its impact on other contextual cues. This knowledge will make a contribution not only towards the promotion of healthy eating habits, but also to marketers and product managers in managing their product offerings. Marketers and product managers can now use the insights of these findings to adjust the size or shape of their products, such that the visibility level of the products presents positive impacts on the consumers that consume their products. This will in turn enhance the brand image of the product and hence the sales performance of the organisation as a whole.

Food marketing is regularly regarded as the one of the key sources of the obesity epidemic (Chandon & Wansink, 2012). Theoretical work on the portion size effect (e.g. Dobson & Gerstner, 2010) and the social effect (e.g. Hirsch & Kramer, 1993) have been widely adopted by marketers in the industry. It is important that the negative consequences of these effects be addressed. The findings of the current study concerning reducing the negative consequences of these effects may promote a better reputation for food marketing. Such positive findings would not only benefit current food marketing practices but also organisations and consumers, who can continue to benefit financially from larger product sizes while maintaining a healthier eating lifestyle.

2.0 LITERATURE REVIEW

The portion size and social effects are two important contextual cues that have a significant impact on the amount of food consumed by individuals (Herman & Polivy, 2005). As discussed in Chapter 1.0, the importance of portion size and social effects are identified not only in various aspects of the literature but also in the food industry, social marketing and public policy-making. Therefore, among the various contextual cues that affect individuals' amounts of consumption,

the current research focuses on portion size and social effects. The following sub-sections outline the literature regarding these two significant factors and how they affect individuals' food consumption behaviours.

2.1 Portion Size Effect

According to Vartanian *et al.* (2008), consumers are often not aware of the external factors, namely consumption contextual cues and food contextual cues, that influence their food consumption behaviours. Hunger has always been assumed to be the principal regulator of how much an individual consumes. Despite the strong social effect that Vartanian *et al.* found in their study, participants were not aware of the impact of the social effect and only reported factors such as taste and hunger as the explanations for how much they consumed. In an earlier study conducted by Herman *et al.* (2005), only 2.5 per cent of the 122 subjects of the study indicated that the amount consumed by their eating partner influenced the amount they themselves consumed, in spite of the high correlation ($r = 0.64$) between their mutual consumption amounts. Further, although personal contextual cues such as hunger largely accounted for the amount consumed by individuals, there are other external contextual cues that are at least as powerful in explaining the variation of amounts consumed by individuals (e.g. de Castro, 1990; Feunekes *et al.*, 1995; Hermans *et al.*, 2010a). In particular, Rolls *et al.* (2002) and Wansink and Kim (2005) conducted experiments that demonstrated that factors that were generally expected to influence food consumption, like hunger and the taste of the food, did not moderate the portion size effect. The portion size effect was shown to have a larger impact on how much individuals consume than the factors that had always been thought to be most influential, such as hunger and the taste of the food. This section presents an overview of the portion size effect in the extant literature.

The literature cites portion size as one of the predominant factors leading to increased amounts of food consumption (Chandon & Wansink, 2011). The existence of the portion size effect among consumers has been demonstrated across many different studies (see Zlatevska *et al.*, 2014). The portion size effect has also been illustrated in a number of experimental studies (e.g. Cavanagh *et al.*, 2014; Rolls *et al.*, 2002; Wansink & Kim, 2005) and the effect is robust across different types of food and drinks (Steenhuis & Vermeer, 2009). The most common justification for the effect of portion size is the perceived appropriateness of the amount to be consumed indicated by the size of the portion served (Herman, Polivy, Pliner, & Vartanian, 2015). This justification is supported by the notion of “unit bias” that is proposed as the explanation for portion size effect (Kerameas, Vartanian, Herman, & Polivy, 2015) and that perceived appropriateness mediated the effect of portion size (Reily & Vartanian, 2016). Kerameas *et al.*, suggest “segmentation effect” is a better terminology for “unit bias” in which individuals identify that single unit is the appropriate consumption amount. Building on the perceived appropriateness in consuming a single unit, individuals end up eating more from a larger unit size food. Zlatevska *et al.* (2014) used a meta-analytic method to quantify the effect of portion size on the amount of food consumption and found that doubling the portion size increases consumption by 35 per cent. However, they also found that the portion size effect is significantly weaker for women when compared to men, children when compared to adults, overweight individuals when compared to non-overweight individuals and within-subject compared to between-subject experimental designs. In summary, the influence of the portion size effect on individuals’ amount of consumption is significant.

Several researchers (e.g. Nielsen & Popkin, 2003; Schwartz & Byrd-Bredbenner, 2006) suggest that the portion size effect can be reduced by increasing an individual’s awareness of the effect of portion size on food consumption amount. Similarly, Albers (2012) and Kristeller and Hallett (1999) suggest that individuals are more likely to eat according to the demands of their bodies

by increasing ‘mindful eating’ (that is, paying attention to the food while eating it). Building on these propositions, Cavanagh *et al.* (2014) examined the effect of educating individuals in order to increase their awareness of the portion size effect. Besides this, Cavanagh *et al.* (2014) and Marchiori and Papies (2014) also looked at whether practicing mindful eating could reduce the portion size effect. They found that neither education to increase awareness of the portion size effect nor mindful eating were effective in reducing the portion size effect. Therefore, overconsumption, which causes a series of health-related issues that are now a major global concern, cannot be avoided by simply educating consumers about the effect of portion size (e.g. Cavanagh *et al.*, 2014; Marchiori & Papies, 2014). This finding is alarming, as the portion size effect has been shown to have a larger impact on how much individuals consume than other factors such as hunger and the taste of the food (e.g. Rolls *et al.*, 2002; Wansink & Kim, 2005). Additionally, marketers in the food and beverage industries utilise the portion size effect as part of their marketing strategy (e.g. Dobson & Gerstner, 2010; Elliott, 1993). It seems that consumers are driven to overeat without realising it and they cannot help themselves to correct this situation. Since consumers are not responding to physiological cues such as hunger and cannot be trained to not overeat in the face of larger portions, these problems emphasise the importance of finding moderators of the portion size effect that can be used as alternative means to reduce its negative impact.

In a meta-analysis study, Zlatevska *et al.* (2012) assert that consumption norms and perceptual processes are the underlying mechanisms of the portion size effect. Consumption norms are the personal guidelines for food consumption that individuals have developed. One example might be continuing to eat even when an individual is feeling full due to parental instructions to finish everything on their plate (which is often known as “plate cleaning”). Another example of a consumption norm would be an individual that eats a fixed percentage of the amount being served. These examples resemble the portion size effect: in both cases the individuals’

consumption amount increased with the increase in portion sizes. However, the upper limit of how much an individual can eat acts as a limitation of consumption norms. Individuals simply cannot consume a fixed percentage or finish everything on their plates if the portion sizes are overly large. When the portion sizes have grown overly large, individuals ought to stop eating. At this level of satiation, any further increase in the portion size does not trigger any consumption increment. This suggests that portion size effect is mediated by internal perceptual processes. Perceptual processes have thus been suggested as the underlying mechanism of the portion size effect when individuals are given overly large portions. In the case of perceptual mediation, the portion size effects get weaker as the portions grow. In their study, Zlatevska *et al.* (2012) concluded that both consumption norms and perceptual processes can be a mediator of the portion size effect. The mechanism of portion size effect has not been thoroughly understood in the extant literature. Based on the preliminary data collected using neuroimaging, English *et al.* (2015) suggest that cognitive differences among different individuals and neural reactions to contextual cues may be important to comprehend the mechanism of portion size effect. Visual cues and bite size remain as possible mechanisms of portion size effect despite the fact that appropriateness is the most widely accepted mechanism of portion size effect (Herman *et al.*, 2015). However, the current research does not investigate the mechanism of the portion size effect, the current research aims to examine the moderators of portion size effect that can be used to reduce the negative effects of increasing portion size.

In summary, findings across different studies and conditions have consistently found that the portion size effect has a strong influence on consumers' food consumption amount. Studies show that the effects of portion size are related to the prolonged negative health issues of being overweight (e.g. Steenhuis & Vermeer, 2009; Young & Nestle, 2002). Other parties have begun to explore the negative impacts of the portion size effect and both social marketing and public health authorities are responding to the possible health threats related to the portion size effect.

Due to the importance of portion size as a contextual cue that influences individuals' food consumption behaviours, it is both necessary and important to study the portion size effect in any food consumption amount study. Despite the knowledge of the profound impact of portion size effect and its negative consequences in the extant literature, the negative consequences resulting from the portion size effect cannot be reduced by making consumers aware of it (e.g. Cavanagh et al., 2014; Marchiori & Papies, 2014). It is therefore important to identify contextual cues that moderate the effect of portion size, as they can be used to reduce its impact. Thus, this research aims to determine contextual cues that moderate the effect of portion size.

In their review of the extant portion size effect literature, Zlatevska *et al.* (2014) assert that the portion size effect can be moderated by three types of influence: individual characteristics, environmental characteristics and specific study environment characteristics. Individual characteristics refer to age, weight characteristics, gender and food focus. Environmental characteristics include social eating, namely eating in a group as opposed to eating alone, product healthiness and conscious consumption. Lastly, examples of study environment characteristics include minimum portion size, study design and study setting. As outlined in Chapter 1.0, the social effect was suggested as one of the strongest influences on consumption behaviour despite the profound impact of the portion size effect. Hence, the current research aims to investigate whether the portion size effect is moderated by the social effect. In order to make sure the moderation effect being investigated in the current research was limited only to the social effect, other environmental and study environment characteristics were controlled in every experimental session. In addition to this, participants were randomly allocated across different experimental sessions and their personal characteristics were also measured. Since every study in the extant literature shows that people consume more when the food portions are larger, the following hypothesis is therefore advanced:

H1: Increasing the portion size will result in an increase in the amount consumed.

2.2 Social Effects

Social effects are the impacts on the amount consumed when consumers are eating with other individual(s). The impact of social effects on consumers' food consumption behaviour has been reported in the literature for many years (de Castro & de Castro, 1989). On top of eating behaviour, social effects are also found in other behaviours such as sporting performance (Carron, Burke, & Prapavessis, 2004), shopping behaviour (Sommer, Wynes, & Brinkley, 1992) and smoking (Leatherdale, Brown, Cameron, & McDonald, 2005). Among the wide literature of food consumption behaviour, de Castro and de Castro identified that individuals' consumption amounts can be influenced by many different social factors, such as social facilitation, encouragement to eat, modelling and avoidance of embarrassment or insult. Similarly, in their review of the literature Herman and colleagues (2003) highlighted that individuals' consumption amounts can be augmented or suppressed when eating in a group. Herman and colleagues (2003) reviewed a large number of empirical studies that investigated the impact of social effects on individuals' food consumption amounts. They categorised the studies into three distinct areas: social facilitation, social modelling and impression management. Thus, in this thesis, social effect and its distinct areas within the literature (social facilitation, social modelling and impression management) refer to eating behaviour unless otherwise specified.

The definition for the three different types of social effects are presented below. Social facilitation refers to the increased food consumption amount of an individual when eating in a group without the presence of a confederate. Social modelling refers to the increased or decreased food consumption amount of an individual depending on the amount consumed by the confederate. Impression management refers to the decreased food consumption amount of an individual intending to convey a specific, desirable impression that occurs when an individual

feels they are being observed or judged by the presence of others. Herman *et al.* (2003) explain the effects of social facilitation, social modelling and impression management using the inhibitory norm model of social influence on eating. Herman *et al.*'s proposed inhibitory norm model suggests that when individuals are eating in a group, they are either concerned with avoiding excessive eating or concerned with eating minimally while intending to maximise palatable food consumption, without this strategy being noticed by the eating partner(s).

Based on the inhibitory norm model of social influence on eating, Herman and colleagues (2003) explained the three categories of social effects as follows. Social facilitation occurs when individuals eating in a group are caught up in a positive feedback loop, where the extended consumption of an individual permits the extended consumption of other individuals with extended consumption time and additional food consumption in social eating events. Social modelling occurs when an individual is eating in the presence of another person who consumes food at a predetermined level; individuals increase or decrease their consumption amount in accordance with the amount consumed by the confederate. The impression management effect can be seen when individuals feel their eating is being observed either by a non-eating observer or an eating companion. The feeling of being observed magnifies their concerns about eating appropriately, hence individuals tend to eat minimally. Based on how Herman *et al.* (2003) categorise the literature of social effect, the current research uses the term impression management. The flowchart below (Figure 1) provides a general outline of the different types of social effect that can be expected under different circumstances. Although the flowchart cannot be used as a framework to make an absolute, accurate prediction for the different types of social effects, it serves as a brief summary of the current social effect literature. The following sub-sections outline the literature in each stream of social effect: social facilitation, social modelling and impression management.

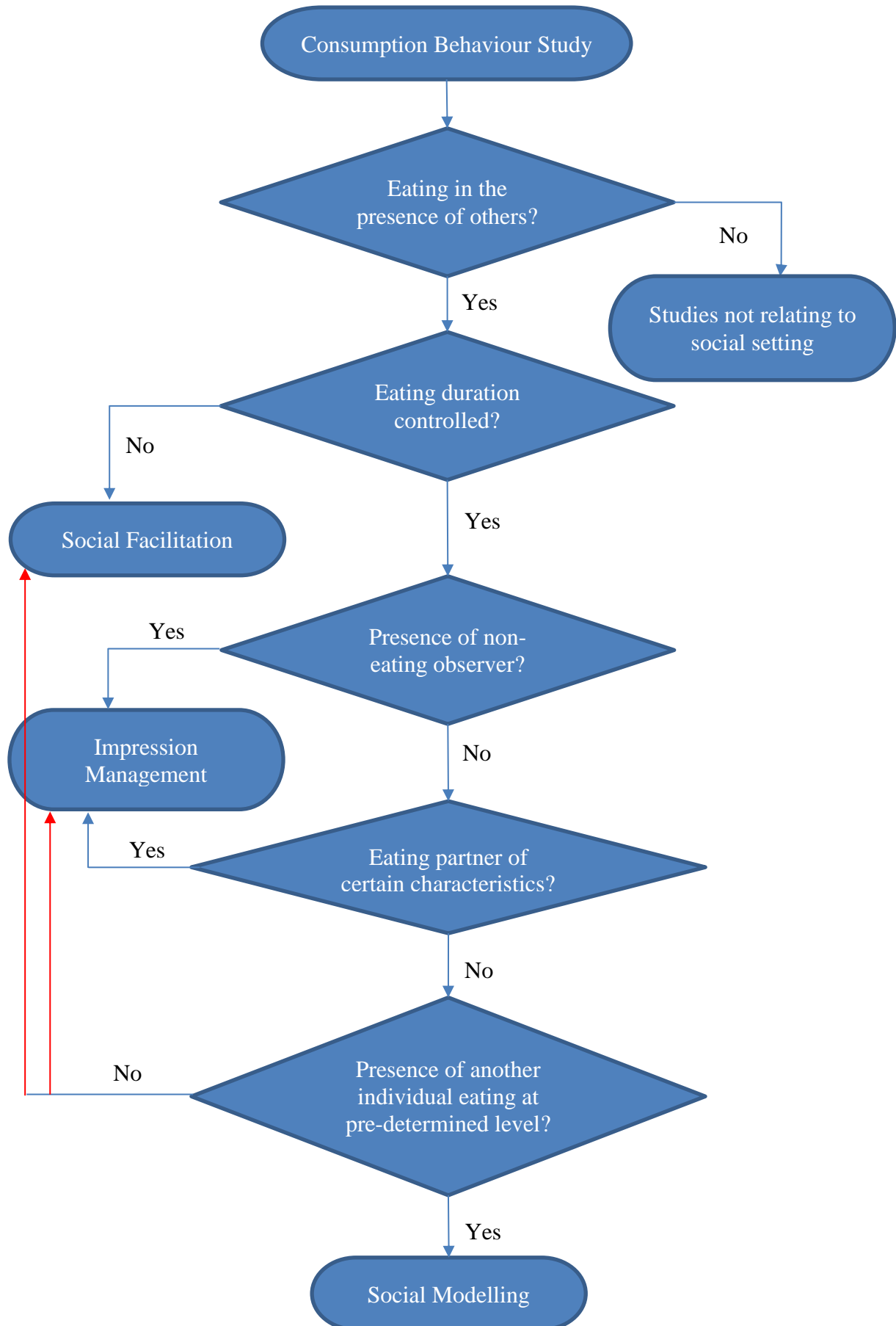


Figure 1: Summary of different social effects reported in the existing literature of food consumption behaviour

2.2.1 Social Facilitation Effect

The social facilitation effect is defined as an increase in response due to the sights and sounds of others present (Allport, 1924). The social facilitation effect has been found in various activities, including sporting performance (Carron *et al.*, 2004), shopping behaviour (Sommer *et al.*, 1992) and food consumption (Clendenen *et al.*, 1994; de Castro & Brewer, 1991; de Castro, 1994; Edelman *et al.*, 1986; Goldman *et al.*, 1991; Hetherington *et al.*, 2006; Patel & Schlundt, 2001; P. Pliner *et al.*, 2006; Redd & de Castro, 1992). This study examines the social facilitation effect only in food consumption; specifically, the increase in food consumption amount that occurs when an individual is eating in the presence of other individual(s) (Herman *et al.*, 2003). Compared to eating alone, eating in a group has been shown to increase consumption amounts by 28 per cent (de Castro & Brewer, 1991).

There are several studies that demonstrate that the food consumption amount is increased when eating in groups in comparison to eating alone (Edelman *et al.*, 1986; Klesges *et al.*, 1984). John de Castro has published a number of social facilitation research papers utilising the dietary diary study method, both singly and with colleagues (Bellisle *et al.*, 1999; de Castro & Orozco, 1990; de Castro & de Castro, 1989; de Castro, 1990; de Castro, Brewer, Elmore, & Orozco, 1990; de Castro, 1991; Redd & de Castro, 1992). These studies contribute the clearest evidence of the social facilitation effect in the extant literature. The social facilitation effect has also been demonstrated in studies that use methods other than the dietary diary study method. Using the observation method, Klesges *et al.* (1984) observed individuals' consumption amount in restaurants and found that the consumption amount is significantly higher with consumers who eat in a group than with consumers who eat alone. However, the presence of the group was not the only factor. Their results also show that the social facilitation effect is stronger when an individual is eating in a group of mixed gender individuals compared to eating in a group of the opposite or same gender and that the social facilitation effect among women is weaker when the

group is larger. We can conclude, therefore, that both group size and gender are important in social facilitation. The gender of the individuals who eat in a group will therefore be taken into consideration in the research design, as it is identified as moderating the effect of social facilitation.

Berry, Beatty and Klesges (1985) were the first to show the effect of social facilitation in a laboratory setting. They found that regardless of the gender of an individual, the consumption of ice-cream is much larger when the individuals are eating in a group of three or four compared to individuals eating alone. Edelman *et al.* (1986) studied 18 military and 32 civilian male employees of the U.S. Army Natick R&D Center eating lunch and found individuals consumed more lasagne when subjects were eating in groups of four or five, compared to when subjects ate alone. Using women as the subjects of their experimental study, Clendenen, Herman and Polivy (1994) reported that food consumption in social conditions of four subjects eating in a group is almost doubled compared to food consumption when subjects ate alone. Through the manipulation of the familiarity among subjects (that is, whether subjects were either eating with friends or strangers), Clendenen *et al.* (1994) found that social facilitation was stronger among friends than with strangers. Based on these findings in the extant literature, the current research seeks to create the social facilitation effect in an experimental setting with *ad libitum* eating conditions. Since familiarity was reported to moderate the effect of social facilitation and the familiarity levels among participants in the current research varies, familiarity was recorded.

The only exception to the general findings of the social facilitation effect in the existing literature is the study of obese and overweight consumers' food consumption in a restaurant that serves their food in a buffet style. Using the observation method, Maykovich (1978) recorded that obese and overweight consumers who do not go to buffet restaurants regularly do not demonstrate the effect of social facilitation when eating in a group. Based on Maykovich's study, it was shown that individuals who fall into this category suppressed their food consumption amount in the

presence of others. However, this exception to the general social facilitation effect is understandable because Maykovich's study focused on a different setting compared to other studies in the extant social facilitation literature. The absence of the social facilitation effect among the obese and overweight non-regular buffet restaurant's patrons can be accounted for by the fact that they were concerned about the opinions of others and felt they were being evaluated. Therefore, in order to avoid the stigma of being judged for the amount of food consumed, this group of people may tend to eat less when others are present at the eating event. Thus, social facilitation was not detected under these circumstances. Given the concerns that overweight individuals may feel that the amount they consume might be judged by their eating partners, the participants' BMI was recorded in the current research.

From the existing social facilitation research findings, the social facilitation effect is identified to be influenced by portion size (de Castro, 1990), meal duration (de Castro, 1990), relationship or familiarity (Clendenen et al., 1994; de Castro, 1994; Salvy, Vartanian, Coelho, Jarrin, & Pliner, 2008; Salvy, Howard, Read, & Mele, 2009; Salvy, Coelho, Kieffer, & Epstein, 2007), gender (Berry *et al.*, 1985; de Castro, 1994; Klesges *et al.*, 1984), the number of other people present while eating (Bellisle et al., 1999; de Castro & Brewer, 1991; de Castro & de Castro, 1989; de Castro, 1990; de Castro et al., 1990; de Castro, 1991; de Castro, 1994; Feunekes et al., 1995; Klesges et al., 1984; P. Pliner et al., 2006; Redd & de Castro, 1992) and the eating partner's weight (Salvy *et al.*, 2009). In addition to this, the social facilitation effect is so strong that it is not even mediated by the hunger level of an individual (de Castro, 1990). These factors that are known to moderate the effect of social facilitation were recorded in the current research.

The social facilitation effect has been consistently demonstrated across a range of different circumstances, with some exceptions. In general, individuals who eat in a group consume more food than individuals who eat alone and this effect is usually stronger when the group size

increases, except when the group consists of women only. The majority of the social facilitation research supports the notion that social facilitation is stronger when the level of familiarity among the individuals who eat in a group is higher and is greater among men eating in a group than women eating in a group. Moreover, simply adding people into an eating event will not necessarily increase the consumption amount of an individual. For instance, Herman *et al.* (2003) suggest that the social facilitation effect will not occur if an individual is eating in the presence of other non-eating individuals instead of eating in the presence of other individuals who are also eating. Hence, the experimental setting was carefully designed such that non-eating individuals (including the researcher) were not in the sight of the participants.

Although the social facilitation effect has been widely investigated in the literature, the mechanism of the social effect is not known. de Castro (1994) propose the time-extension hypothesis in explaining the social facilitation effect. Time-extension hypothesis refers to the increased amount consumed by individuals due to the meal duration that increases with the number of eating partners. Similarly, Pliner *et al.* (2006) suggest it is the extended time of exposure to food that causes the social facilitation effect. Through manipulating the meal duration (12 vs. 36 minutes) along with gender and group size, Pliner *et al.* show that participants in longer meal duration consumed more. Although Brindal *et al.* (2011) concluded that the time-extension hypothesis itself is insufficient to explain the social facilitation effect in their empirical study, the observation method employed in their study did not allow direct exposure or extended time of exposure to food. Therefore, the current research suggests that Brindal *et al.*'s findings are not directly comparable to those of de Castro *et al.* and Pliner *et al.* In the extant literature, the time-extension hypothesis is the most widely accepted explanation for social facilitation. It is important to note that not many social facilitation studies to date (e.g. Pliner *et al.*, 2006) controlled the eating duration. Hence, by keeping the eating duration consistent across every

experimental session, the current research aims to investigate whether the effect of social facilitation could be detected.

In summary, the social facilitation effect in the existing literature has been observed in both the natural environment using the dietary diary method (de Castro & de Castro, 1989; de Castro, 1990; de Castro, 1994) and the laboratory setting using the experimental method (Berry et al., 1985; Clendenen et al., 1994; Edelman et al., 1986; Maykovich, 1978; Mori, Chaiken, & Pliner, 1987). The dietary diary method allows for observation in a natural setting while the experimental method occurs in a laboratory setting that can be overly artificial (Meiselman, 1992). However, neither the dietary diary method nor the laboratory setting experimental method is perfect. Although the food consumption amount reported in the dietary diary method may be less accurate than that in a laboratory setting, as it is recorded purely based on participants' own estimates, this eating event is more natural. In the laboratory setting experimental method, on the other hand, the food consumption amount is reported more accurately. However, the laboratory setting can be quite different from the normal setting of a typical eating event and this artificial setting may alter the consumption behaviour of an individual. Therefore, this research includes as many naturalistic features as possible into the laboratory setting experiment to resemble as closely as possible a normal setting of a typical eating event.

2.2.2 Social Modelling

The social modelling effect describes when an individual changes their behaviour to follow that of those around them. The importance of the social modelling effect on health-related behaviour includes smoking (Leatherdale *et al.*, 2005), alcohol consumption (Wood, Read, Mitchell, & Brand, 2004), food choices and food consumption amount (Hermans, Larsen, Herman, & Engels, 2008; Nisbett & Storms, 1974). The current research focuses only on factors that influence the food consumption amount of individuals; therefore, the social modelling effect throughout this

document refers to how an individual's consumption amount may be influenced by an eating partner's consumption amount. The difference between social modelling and social facilitation lies in the reference point of comparison. The social facilitation effect is reported in studies that demonstrate individuals eat more food in a social setting by comparing individuals eating in a group and individuals eating alone. Social modelling, on the other hand, looks at how the consumption amount of individuals is affected by the consumption amount of their eating partners. These studies show that individuals consumed more food when they are eating with eating partners (confederates) who ate more, by comparing them with individuals who consumed less food when eating with eating partners (confederates) who ate less.

The social modelling effect is a theory built on the basis of social learning. Social learning is a construct that measures the extent to which the target behaviour demonstrated by the modeller is being mimicked (Bandura, 1977). Similar to the social facilitation effect, the effect of social modelling supersedes other essential effects like hunger and satiety (Goldman *et al.*, 1991). Through a series of two experiments, Goldman et al. (1991) examined the effect of social influence on individuals with differing hunger level by instructing them to refrain from eating for 4 hours (low deprivation), 12 hours (moderate deprivation) and 24 hours (high deprivation) before eating with a confederate in a taste test session. Second experiment included a control (no confederate) condition to exhibit the efficacy of hunger manipulation and removed moderate deprivation condition since first experiment suggested its redundancy. Although participants were invited to two taste test sessions (lunch time and afternoon) in both experiments, only the data collected in the first session (conducted during lunch time) was considered. The second taste test session and instruction of deprivation between the first and second taste test were used to ensure that participants would not restrain their consumption. The effect of social influence has shown to be strong such that individuals still conform to the amount consumed by the confederate even when they have deprived for 24 hours.

Existing social modelling literature reveals that the presence of others can facilitate or suppress an individual's food consumption amount depending on the conditions. However, Herman *et al.* (2003) point out that it is not known in a social modelling study to what degree the social modelling effect is influenced by certain characteristics of the eating partner (the confederate), such as demographic similarity. The social modelling effect refers to the increased or decreased food consumption amount of an individual depending on the amount of food the confederate consumes. Due to the need to manipulate the consumption amount model in order to test it, social modelling effects have only been studied in laboratory settings with the experimental method and have not been studied in a natural setting such as is common in social facilitation research. In social modelling studies, subjects ate with a confederate who was instructed to eat in either a restrained or augmented manner (e.g. Hermans *et al.*, 2012a; Hermans *et al.*, 2008; Hermans, Larsen, Herman, & Engels, 2009; Hermans, Engels, Larsen, & Herman, 2009; Hermans *et al.*, 2010a; Hermans *et al.*, 2012). In summary, the restraints of the confederates are the independent variables of social modelling studies and the subject's consumption amount is the dependent variable.

The first social modelling study on food consumption was conducted by Nisbett and Storms (1974). They studied the effect of social modelling by recruiting subjects to taste crackers in conditions of inhibition (they termed it as social suppression conditions), augmentation conditions (they termed it as social facilitation conditions) and eating alone. Confederates ate only one cracker in the inhibition condition and 20 crackers in the augmentation condition. Nisbett and Storms found in the augmentation condition, the average food consumption amount of an individual increased when compared to the inhibition condition. Compared to the eating alone condition, Nisbett and Storms found that normal weight participants in the inhibition

condition consumed less. However, overweight and underweight participants in the inhibition condition did not consume less than participants in the eating alone condition.

Stanley Schachter's (1971) externality theory of obesity postulates that obesity is a result of each individual's different receptivity to contextual cues; however, empirical findings in the existing literature on food consumption behaviour do not support this theory. The externality theory of obesity suggests that obese individuals are less attuned to internal satiety cues and rely more on external cues in determining their level of hunger and when making decisions about food choices. Building on this research, Rosenthal and McSweeney (1979) examined overweight students' receptivity to contextual cues of food consumption. Their study is an early example of food consumption social modelling studies. They hypothesised that the degree of social modelling effect on food consumption rate and food consumption amount varies for obese and non-obese participants. Although their experimental results did not provide empirical support for the externality theory of obesity, their findings did suggest that food consumption rate and food consumption amount can be influenced by social contextual variables. Other social modelling studies (e.g., Conger et al., 1980; Nisbett & Storms, 1974) also provide support for the notion that the social modelling found in food consumption behaviour does not vary between obese and non-obese subjects. de Luca and Spigelman (1979) examined a confederate's obesity effect on the social modelling of snack consumption by fixing the amount of snack consumption for all confederates in all conditions. It was shown that obese individuals consumed more snacks when eating with an obese confederate than those obese individuals who were eating with a non-obese confederate. However, non-obese individuals consumed more snacks when they were eating with non-obese confederates, compared to non-obese individuals who were eating with an obese confederate. These results support the social modelling effect and suggest that whether the experiment confederate is obese or non-obese may change the effect of social modelling. This reinforces the requirement to control for respondents' BMI in this study.

The social modelling effect has been demonstrated through the evidence of participants modelling the consumption amount of the confederate. In their experiment, Rosenthal and McSweeney (1979) examined the influences of confederate eating on consumption behaviour at levels deemed socially appropriate and socially inappropriate. They found that female participants consumed fewer crackers (14.87 crackers on average) when they were paired with a female confederate with a low consumption amount of 10 crackers. On the other hand, female participants who were paired with a female confederate with a high consumption amount of 40 crackers consumed more crackers (17.95 crackers on average). When female participants were eating alone, **they consumed the most** (21.23 crackers on average) **among all conditions**, with the consumption amount closer to the amount consumed by individuals in the high consumption condition. Roth *et al.* (2001) conducted research that studied the social modelling effect by using a remote confederate. In their research, a copy of a made-up record of the food consumption amount of previous study participants was purposefully left on the table where the participants ate. These records were presented in a way that made it look like leaving them there was a mistake. These made-up records functioned as remote confederates and were used to manipulate the social modelling conditions of high and low consumption. When participants were eating alone, they modelled the consumption amount of remote confederates. When participants were eating in the presence of a non-eating observer, participants tended to eat minimally instead of modelling the consumption amount of the remote confederates. As a result of demonstrating the social modelling effect using remote confederates, Roth *et al.* concluded that norm for minimal eating precedes matching norm. That is, the impact from non-eating observer is greater than the impact from the remote confederate.

Other studies that have examined the social modelling effect. Chaiken and Pliner (1987) assert that because women are more concerned about eating and body image than men, women are

more likely to adhere to norms of eating that are socially derived. Roel C. J. Hermans *et al.* (2013) published a series of social modelling studies where participants were invited to eat with a confederate who eats a pre-determined amount under different pretexts. In response to the lack of comparability with actual eating situations which might induce uncertainties and invoke more vulnerability towards social influence in consumers' food consumption amounts, he used a naturalistic experimental approach. Hermans *et al.* (2008) find that the social modelling effect among young women is weaker when they are consuming low-energy-dense food. However, some of the young women in their study did show the effect of social modelling in their consumption with both high-energy-dense and low-energy-dense food. Hermans *et al.* (2008) reported that the weight of an eating companion influences the effect of social modelling. Their investigation finds that young women did not model the consumption amount of a slim eating partner, while they did model the consumption amount of a normal weight eating partner. However, the social modelling effect is influenced by the weight appearance of an eating companion only when the food was high-energy-dense. Hermans *et al.* (2009) examined an eating partner's social nature as a moderator for the social modelling effect. In their investigation, they find that the consumption amount of an unsociable eating companion is more likely to be modelled by young females in comparison to the consumption amount of a sociable eating companion. Hermans *et al.* (2010b) find that in a breakfast context, young females respond to the suppression effect of social modelling but do not respond to the facilitation effect. They suggest that the social modelling effect may be countered by the scripting or routine of the highly familiar breakfast context. Therefore, the social modelling effect is found to be weaker in the breakfast context. Through a three (confederate's intake: small, standard, large) by two (portion size: small, standard) between-subject experimental design, Hermans *et al.* (2012) reported an additive effect between the social modelling effect and the portion size effect. Standard and small size portion were 500g and 250g respectively; confederate's intake was halved (250g in standard-size and 125g in small-size condition) in small intake condition and increased by 50% (750g in

standard-size and 375g in small-size condition) in large intake condition. Participants in Hermans *et al.*'s (2012) study ate more in large portion condition and modelled the amount consumed by confederate.

Most of the social modelling studies in the extant literature involved only female participants. This may be due to the fact that social norms regarding appropriate intake, which was proposed as one of the mechanisms to explain the social modelling effect, is assumed to have higher importance for women than for men. Due to the scarcity in the extant literature, Hermans *et al.* (2010a) explored the social modelling effect among males by using only male participants as their subjects. In their experiment, Hermans *et al.* found that the social modelling effect also existed among male individuals. However, only hungry male participants in their study demonstrated the social modelling effect. This is evident through the fact that only those participants who reported a high level of pre-experimental hunger modelled the amount consumed by the confederate. Herman *et al.*'s findings on the social modelling effect among male participants as being qualified by the participants' hunger level are therefore not consistent with Goldman *et al.*'s (1991) findings, where the social modelling effect was found among female participants in spite of the participants' hunger level.

Although Herman *et al.* (2003) use a normative framework to explain the effect of social modelling, this framework does not explain the different levels of social modelling effect found in different individuals. Hermans *et al.* (2012a) identified this research gap and suggest that the eating behaviour of an eating companion, which may act as a contextual cue prompting the individual to consume, may be the explanation for the different levels of the social modelling effect found in different individuals. Therefore, Hermans *et al.* investigated several contextual cues that may affect the social modelling effect. Herman and Polivy (2008) find that individuals' consumption are stimulated by external cues such as normative cues (for example, portion size)

and sensory cues (for example, palatability). Moreover, the attention paid to food is also suggested to increase food consumption amount (Nisbett, 1968; P. L. Pliner, 1973). Building on this, Herman *et al.* (2012a) hypothesised that attentional bias (that is, attention towards the food) increases the effect of social modelling among women. Impulsivity was also hypothesised as a moderator of social modelling effect, with the reasoning that individuals with a higher level of impulsivity may have a lower ability to regulate their urge towards eating cues. Focusing on the two aspects of impulsivity, Herman *et al.* (2012a) investigated the effect of impulsivity by measuring participants' self-reported impulsivity and response inhibition. In their experiment, Hermans *et al.* (2012a) showed that the impulsivity of young females moderates the social modelling effect, while the attentional bias and response inhibition of young females did not moderate the social modelling effect. The social modelling effect is only found among young females who are low-impulsive ($p < 0.001$), but not among those who are high-impulsive ($p > 0.20$), regardless of attentional bias and response inhibition.

In summary, the social modelling effect has been consistently demonstrated across different studies. As shown in Figure 2 below, the social modelling effect is moderated by confederate's weight appearance (de Luca & Spigelman, 1979; Hermans *et al.*, 2008; Rosenthal & McSweeney, 1979), gender (Conger *et al.*, 1980; Salvy *et al.*, 2007), self-esteem and empathy (Robinson, Tobias, Shaw, Freeman, & Higgs, 2011) and social acceptance (Robinson *et al.*, 2011). The unique effect of social influence is mediated by food palatability (P. Pliner & Mann, 2004) as well as scripting and routine (Hermans *et al.*, 2010a). An individual's diet restraint pattern does not affect the extent of the social modelling effect on an individual (Polivy, Herman, Younger, & Erskine, 1979; Rosenthal & McSweeney, 1979). These moderators will be carefully taken into account in the research design and data analysis. Cruwys, Bevelander and Hermans (2015) found that modelling effect is stronger among individuals with stronger desire to affiliate with the eating partner and weaker when consuming healthy-snack foods and meals that are usually scripted

such as breakfast and lunch. Another important finding in Cruwys et al.'s research is that modelling effect is at least partially mediated through behavioural mimicry; behavioural mimicry occurs without conscious awareness.

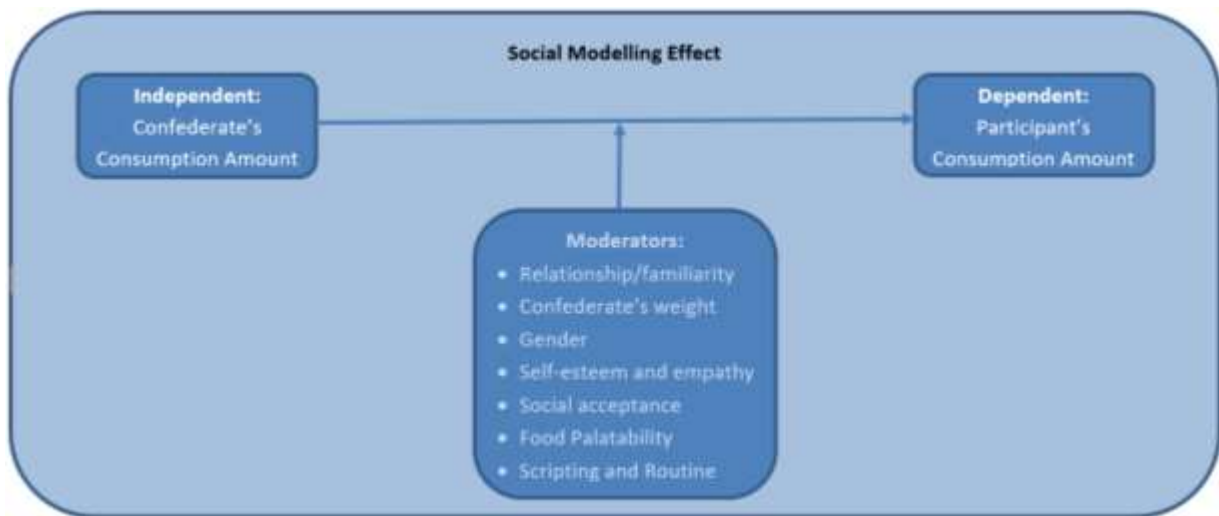


Figure 2: Social Modelling Effect - Moderators and Mediators

2.2.3 *Impression Management*

The effects of social eating operate in two directions (Conger *et al.*, 1980; Herman *et al.*, 2003). Certain studies found that individuals who were eating in a group consumed more than individuals eating alone; these studies are labelled as social facilitation studies. In contrast to social facilitation studies, impression management studies found that individuals reduced their consumption amount under two circumstances. The first type of impression management study involves individuals who consumed less when eating in the presence of a non-eating observer when compared to individuals eating alone or individuals eating with another eating partner. The second type of impression management study involved individuals that consumed less when they were eating in the presence of an eating partner with certain characteristics. The effect of impression management on eating is an interpretation proposed by Herman *et al.* (2003) to

explain the reduced amount of food consumed by individuals when they are eating in the presence of a non-eating observer or a certain group of eating companions.

Herman *et al.* (2003) explored in further detail the two types of impression management studies. The first are studies that examined the effect of a non-eating observer on an individual's consumption amount. Although the eating companion in social facilitation and social modelling studies is presumed to be an observer, they are also a co-actor. The fact that the co-actor eats together with the subjects in an experiment, while a non-eating observer does not, permits the perception that the non-eating observer is more likely to be judgemental. In addition to this, it is important to note that the non-eating observers were pure observers and had no access to food at all (Herman *et al.*, 2003). Clearly, if they had access to food but did not consume any, non-eating observers would set some social norms or behavioural examples of not eating.

The second type of impression management study examines the effect of different eating companions on an individual's consumption amount. Unlike the first type of impression management studies, which examine the effect of a non-eating observer, individuals in the second type of impression management study eat in the presence of an eating companion. However, the variation of the individuals' food consumption amount is less dependent on the amount of food consumed by others present and more dependent on the specific characteristics of the others present. In other words, it is less important how much the eating partner is eating but whether or not they are overweight, a family member or other specific characteristics.

2.2.3.1 The Effect of a Non-eating Observer on an Individual's Consumption Amount

Herman *et al.* (2003) suggest that the reduced consumption amount of an individual when eating in a social setting is generally influenced by that individual's feeling of being observed due to the presence of others. Herman *et al.* indicate that the suppressive effect resulting from non-

eating observers provides the most solid evidence that individuals do not always consume more in social settings. They call this the impression management effect. There are a number of studies in the existing literature which demonstrate the impression management effect involving individuals eating with non-eating observers.

In a study that compared the likelihood of overweight and normal weight individuals' consumption being influenced by social cues (criteria based on Metropolitan Weight Norms, 1959), Conger *et al.* (1980) used a taste experiment as a cover story and invited participants to taste crackers in the presence of a confederate who either did not taste the cracker at all, tasted a small amount of crackers or tasted a large amount of crackers. Participants who tasted the crackers in the presence of a confederate who did not taste the crackers (the non-eating observer) under the guise of starting the experiment early, consumed significantly less than participants who tasted the crackers with a confederate who tasted a small amount of crackers. Although the suppression effect arising from the non-eating observer was not further discussed in the study, Conger *et al.*'s experimental design provides evidence of the suppression effect in the presence of a non-eating observer.

Examining the prevalence of different norms in consumption amount behaviour, Roth *et al.* (2001) invited 152 female undergraduates to a cookie tasting experiment and randomly assigned them to three different norm conditions (inhibitory norm, augmentation norm and no norm), either with or without a non-eating observer, which resulted in six experimental conditions. In the inhibitory norm condition, participants tasted the cookies with the understanding that previous participants had eaten small amounts. Participants who were assigned to the augmentation norm condition tasted the cookies with the understanding that previous participants had eaten large amounts. With the no norm condition, participants were not given any indication of how much previous participants had eaten. Results showed that participants in every

experimental condition ate minimally in the presence of a non-eating observer. On the other hand, participants who ate alone without the presence of a non-eating observer consumed either a large amount or small amount of cookies depending on the norms to which they were exposed. That is to say, the suppression effect on consumption amount imposed by a non-eating observer superseded the imposed norms which served as a guide to consumption according to the perceived appropriate consumption amount. Therefore, impression management was detected when individuals ate in the presence of a non-eating observer. Roth *et al.* (2001) explain this phenomenon through the prevalence of a minimal-eating norm over a matching norm. Given that competing in eating and body weight have been recognised as a socially acceptable practice among women (Rodin, Silberstein, & Striegel-Moore, 1984), Roth *et al.* (2001) used the competitive motive to understand the reason for the prevalence of the minimal-eating norm. The competitive motive proposed by Roth *et al.* as the explanation for the prevalence of minimal-eating norm is consistent with the inhibitory norm model proposed by Herman *et al.* (2003), which explains the different consequences of the social effect. The differing explanations of Roth *et al.* (2001) and Herman *et al.* (2003) are outlined in Figure 3 below.

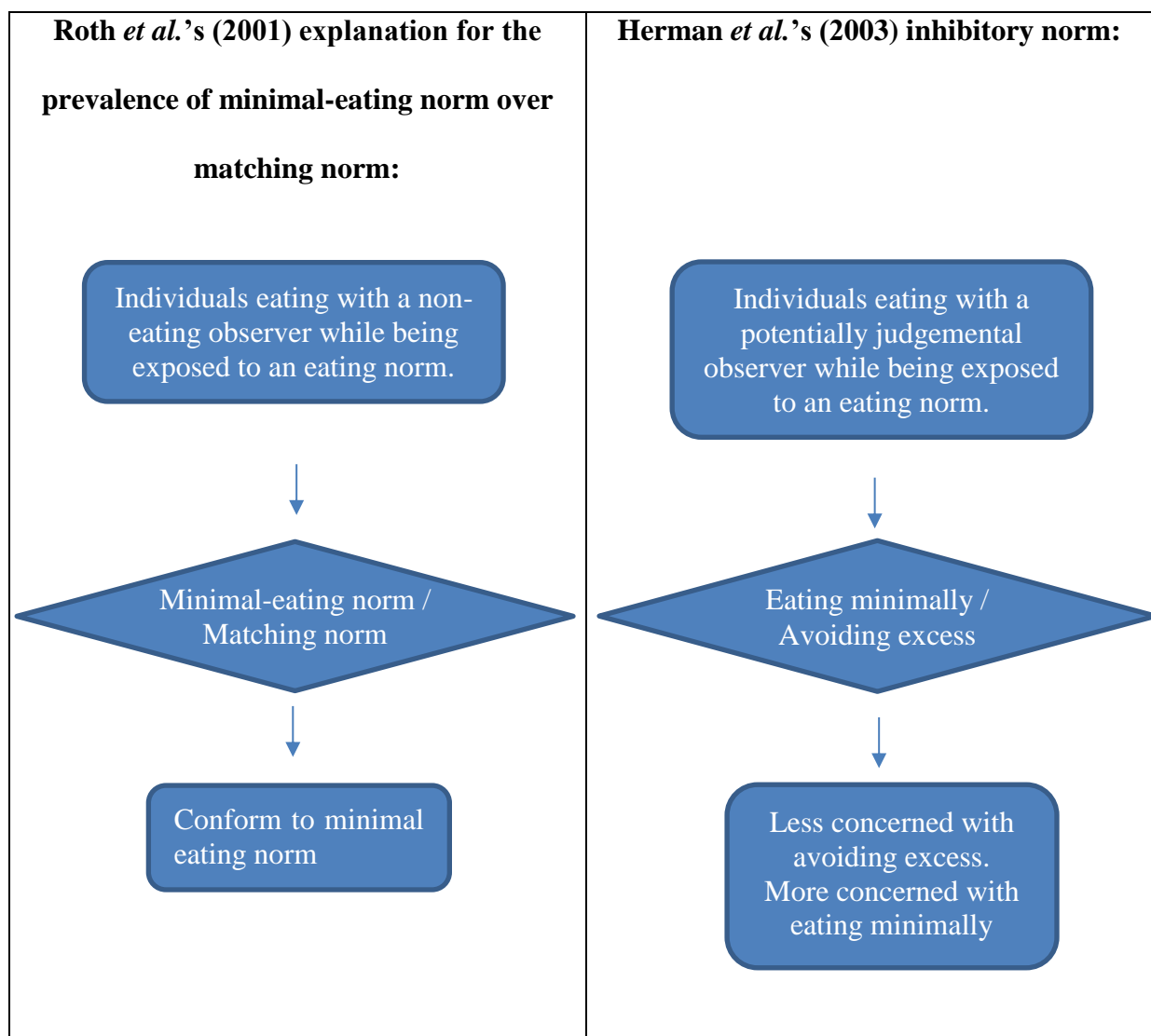


Figure 3: Comparison of Roth *et al.*'s (2001) explanation for the prevalence of minimal-eating norm over matching norm and Herman *et al.*'s (2003) proposed inhibitory norm model

A strong suppression effect has been observed when an individual eats with a non-eating observer. Similar to the discovery by Roth *et al.* (2001) that the social modelling effect applies with a remote confederate, impression management occurring due to the influence of a non-eating observer can also be detected using a remote non-eating observer. According to Stuart and Davis (1972), the behavioural weight control strategy is effective in reducing the amount of food that overweight patients consume. The behavioural weight control strategy requires overweight patients to record all of the food that they consumed and show this record to their therapists. In support of Stuart and Davis's (1972) findings that monitoring was effective as a behavioural

weight control strategy when used in clinical conditions, Stunkard and Mahoney (1976) attributed the effectiveness of the behavioural weight control strategy to the effect of monitoring. Stunkard and Mahoney claim that the monitoring approach is one of the most vigorous components in behavioural treatments for overweight patients.

In line with behavioural weight control strategies, Polivy, Herman, Hackett and Kuleshnyk's (1986) studies showed that impression management can be detected even when a non-eating observer is not actually present during the eating event (that is, the experimenter who records participants' consumption amount at the end of the experiment). Polivy *et al.* (1986) used a two by three experimental design (preload or no preload versus control, self-attention or public attention) to examine the suppressive effect. Participants in the preload conditions tasted and rated two types of milkshakes or chocolate cakes before the lollies or cookies taste test while participants in the no preload conditions did not go through the milkshakes or chocolate cakes taste test before the lollies or cookies taste test. In self-attention conditions, participants had to count the number of lollies or cookies they had consumed; however, they were led to believe that their total consumption was not known by anyone except themselves. In public-attention conditions, participants had to count the number of lollies or cookies they had consumed, and their total consumption was known to the experimenter. Although their study was complicated by the inclusion of high-calorie preload, they demonstrated that public attention (a remote non-eating observer) reduced individuals' consumption regardless of their restrained eating level. Polivy *et al.*'s findings were validated by repeating the study with a different food type but the same experimental procedure. The suppressive effect was still present. Hence, Polivy *et al.* demonstrated a suppressive effect occurs when participants eat in conditions of public attention. In addition to the findings on the remote non-eating observer effect, Polivy *et al.* also concluded that the adherence to regulatory norms can be induced by making participants self-conscious by keeping track of their consumption. This conclusion was made based on the comparison of public

attention and self-attention conditions with the control condition as participants in the control condition had difficulty tracking their consumption.

Studying the combined effect of non-eating observers and the amount of preload meals consumed on eating behaviour, Herman, Polivy and Silver (1979) manipulated the presence of a non-eating observer and the required amount of preload meals to be consumed prior to the tasting experiment. Food tasting was used as the cover story to study participants' consumption amount behaviour. By stressing the importance of consistent satiety levels among all participants following the preload meals for the taste perception experiment, participants were instructed to consume as much as was necessary to achieve comfortable satiation of a liquid meal within seven minutes. Participants were either given a 6 oz or 16 oz glass filled with 5 oz or 15 oz liquid meal and a pitcher of extra liquid meal as the preload meal. Participants were instructed to drink at least a glassful of the liquid meal (5 oz or 15 oz) and continue to drink more from the pitcher if necessary until satiation is achieved. The experimenter either left the room or stayed in the room with the participants during the seven-minute preload meal to manipulate the observation condition. The tasting experiment phase started right after the preload meals, when participants were given a bowls each of cashews, peanuts, almonds and sunflower seeds. The tasting experiment phase lasted 10 minutes without the presence of an experimenter. This experimental design encouraged participants to monitor their consumption to achieve satiation both with and without the presence of a non-eating observer. Although the results indicated that the presence of a non-eating observer did not suppress participants' consumption amounts, a more normal regulatory response was detected among restrained eaters in the presence of a non-eating observer. Participants were more likely to consume an appropriate amount (that is, a larger consumption amount following a smaller preloaded amount and smaller consumption amount following a larger preload) in the presence of a non-eating observer. Similarly, Herman *et al.* (1979) also argue that monitoring intake based on caloric needs is a better approach than

monitoring intake based on the goal of consuming minimally while neglecting the caloric needs as an appropriate model for successful dieting.

Non-eating observers cause a suppression effect on food consumption not only for normal individuals but also for individuals with severe eating disorders. Herman *et al.* (2003) suggest that *bulimia nervosa* is probably the best evidence of the strong suppression effect caused by the presence of a non-eating observer in an eating event. According to Abraham and Beumont (1982), every *bulimia nervosa* patient stated their preference for being alone when binge eating. On the other hand, it has also been reported that there is a much higher possibility of binge eating occurring when individuals eat alone compared to social eating situations (e.g. Stice, Telch, & Rizvi, 2000; Waters, Hill, & Waller, 2001). Herman and Polivy (1996, p. 230) even suggest that the presence of another person without a binge eating problem is possibly the only reliable way to stop binge eating. In summary, there is a significant amount of evidence concerning how the presence of a non-eating observer can reduce an individual's food consumption amount.

2.2.3.2 The Effect of Different Eating Companions on an Individual's Consumption Amount

Instead of eating in the presence of a non-eating observer, the second type of impression management study involves placing individuals with eating partners who have different characteristics that induce the need to convey a good impression. According to Leary and Kowalski (1990), an individual has different levels of eagerness to convey a good impression when eating with different types of eating partners. In most cases, reducing the amount of food consumed is considered as a means to convey a good impression (Herman *et al.*, 2003). Based on this proposition, Herman *et al.* (2003) suggest that individuals would reduce their

consumption amount when they are eating with eating companions to whom they wish to convey a good impression.

The social effect on food consumption is complex as the impact differs with conditions. The second type of impression management study is the final type of social effect discussed in this thesis. The differences between each type of social effect in the literature, based on Herman *et al.*'s (2003) literature review, are as follows. Social facilitation studies show that the amount of food individuals consume increases when they are eating in the presence of other individuals without confederates. Social modelling studies show that individuals' food consumption amount depends on the amount consumed by the confederate as an eating partner. Impression management studies show that individuals' food consumption amount decreases when they are eating in the presence of a non-eating observer or eating partner with certain characteristics.

Although studies that are labelled as impression management in the extant literature have the opposite effect to social facilitation studies (decreased consumption in a social setting instead of increased consumption), the evidence of impression management is also seen in social facilitation studies. de Castro (1994) investigated the impact of the relationship between individuals who are eating together on the amount they consume and found that the effect of social facilitation is strongest when an individual is eating with friends or family. de Castro's findings suggest that impression management is more important when the relationships between individuals who are eating together are weaker or the familiarity level is lower. This finding is consistent with Tice, Butler, Muraven and Stillwell's (1995) research, which found that individuals are more eager to make favourable impressions in interpersonal interactions that take place with those they know than interpersonal interactions that take place between strangers. The theory of impression management assumes that individuals tend to portray themselves in ways that maintain or mitigate their desirable identity images. Therefore, it is assumed that individuals tend to consume

less when eating with companions of certain characteristics in order to maintain or enhance their desirable identity images (that is, the suppression effect in impression management studies). Additionally, there is a plethora of evidence (Basow & Kobrynowicz, 1993; Bock & Kanarek, 1995; Chaiken & Pliner, 1987; Vartanian, Herman, & Polivy, 2007) that demonstrates that women's feminine identity – that is, that they are seen as more feminine when they eat less – can be enhanced by reducing their food consumption amounts.

In the most widely cited impression management study within the food consumption amount literature, Mori et al. (1987) manipulated perceived social desirability and gave male and female participants opportunities to snack with either same gender or opposite gender for their participation in a “get acquainted study”, which was used as a cover story. They found that both male and female participants tended to eat less when participants were eating with an opposite gender confederate. The suppression effect they found in the study is strongest when female participants were paired with a socially desirable male confederate. However, all participants consumed less than the confederate. In order to verify their findings on women's self-presentation when eating and investigate this topic in a more direct manner, a second experiment was conducted in which participants' feminine identities were either threatened or enhanced. Feminine identity refers to a woman's personality, behavioural style or appearance being ladylike (Stein & Bailey, 1973). Additionally, participants were led to believe that their male eating companion was either aware or unaware of their gender feedback. Gender feedback is the feedback participants received in regards to the similarities of their interests to other male and female college students nationwide based on a questionnaire they completed earlier in the study. The gender feedback participants received from experimenters was then used to threaten or enhance their feminine identities. The impact of this manipulation on the amount of food consumed by female participants was consistent with the Mori et al.'s (1987) hypothesis based on Schlenker's (1982) analytic-identity theory of social conduct: that female participants whose

feminine identity was threatened in partner-aware conditions (they received feedback that they were perceived as masculine rather than feminine) and female participants whose feminine identity was enhanced in partner-unaware conditions (they received feedback that they were perceived as feminine rather than masculine) reduced their consumption amounts. Strong relationship between meat and masculinity as well as vegetarianism and femininity were shown in the research conducted by Rozin, Hormes, Faith and Wansink (2012). Although Vartanian (2015) concludes that individuals' eating behaviour could be heavily influenced by impression management, the complexity of this effect has not been well understood.

The notion that women reduced their food consumption amounts in order to enhance their feminine identity is further supported by the results of Mori *et al.*'s (1987) second experiment, in which females tended to reduce their consumption amount when their feminine identity was threatened and made known to their eating companion. However, it is possible that women reduced their food consumption amounts in order to enhance other good qualities they were concerned about (Baumeister & Jones, 1978). Furthermore, Mori *et al.*'s (1987) first experimental results showed that male participants also reduced their food consumption amounts when eating in the presence of the opposite gender. Therefore, enhancing femininity is not the only factor causing a woman to reduce their food consumption amount; other factors include considerations of other positive characteristics that the individual is concerned about such as attractiveness.

Mori *et al.*'s (1987) finding on women's reduced food consumption amounts in the presence of an attractive eating companion of the opposite gender in order to convey an impression of femininity is supported. Using an experimental design, Pliner and Chaiken (1990) provided empirical evidence that men and women reduced their food consumption amount when they were eating in the presence of an attractive opposite gender confederate when compared to eating in

the presence of an attractive confederate of the same gender. Consistent with the experimental results in Mori *et al.*'s (1987) study, in which the effect of impression management among female participants were more profound, Pliner and Chaiken (1990) conducted a questionnaire study to clarify the experimental findings. The results of their empirical research indicated that the consumption behaviour of both men and women were influenced by individual's eagerness to behave in a socially desirable manner. The experimental design, which allowed participants to speculate on their own consumption behaviour and motives in different situations, further explained the mechanism of impression management. The female participants who reduced their consumption amount were primarily driven by the motivation to enhance their femininity and the male participants who reduced their consumption amount were primarily driven by the motivation of enhancing their competence. Overall, the study found that social desirability is the primary motivation for both men and women to reduce their food consumption amount in order to convey a good impression to their eating partners.

Unlike the other studies that looked at the effects of gender on impression management, de Luca and Spigelman (1979) studied the effect of eating companions' weight on impression management for both obese and non-obese female participants. A total of 40 participants, comprising 20 obese women and 20 non-obese women, were given incidental food access in the presence of either an obese or non-obese female experimental confederate who consumed a total of 10 candies throughout the 10-minute experimental session for each experimental cell design. The results showed that there was an interaction between participants' weight status and the experimental confederate's weight status, with obese participants consuming significantly more when eating in the presence of an obese confederate. Furthermore, the amount consumed by non-obese female participants was not affected by the experimental confederate's weight status. In an earlier experiment, Schachter *et al.* (1974; see de Luca and Spigelman, 1979, p.127) discovered that "obese subjects are more responsive than non-obese subjects to food related cues

when such cues are highly salient or prominent for the subject.” They called this the external sensitivity theory. Based on this theory, the obese subjects in de Luca and Spigelman’s (1979) experiment should be more susceptible to salient contextual cues. However, de Luca and Spigelman found that Schachter’s external sensitivity theory of obesity only holds when an obese individual is eating with another obese individual; that is, obese individuals were only more responsive to salient food-related cues when their eating partners were also obese. Therefore, de Luca and Spigelman (1979) concluded that using Schachter’s (1971) external sensitivity theory of obesity to explain the eating behaviour of obese subjects is conditional.

Despite their empirical findings being inconsistent with Schachter’s (1971) external sensitivity theory of obesity, de Luca and Spigelman (1979) were not surprised by their results. They explained the qualification of Schachter’s external theory of obesity through the theory of self-consciousness. In the extant literature, a plethora of studies (e.g. Maddox, Back, & Liederman, 1968) showed that obesity is associated with negative social image. Therefore, de Luca and Spigelman asserted that obese subjects may experience higher levels of self-consciousness when they are eating with non-obese individuals whom are assumed to be judgemental and, hence, the obese subject reduces the amount they consume. On the other hand, obese subjects who are eating with obese individuals did not reduce their consumption amount. de Luca and Spigelman proposed two possibilities to explain these phenomena: firstly, that obese subjects who were paired with obese individuals may have lower levels of self-consciousness; or secondly, that an obese subject wanted to avoid making their obese eating partner feel discomfort and like they were being discriminated against, hence they did not reduce the amount they consumed. These proposed explanations are supported by the complaints made by obese eating partners (confederates) about the discomfort of eating large amounts of lollies in the presence of non-obese subjects who consumed less. The theory of self-consciousness proposed by de Luca and

Spigelman therefore supports the notion of qualification of Schachter's external theory of obesity.

The theory of self-consciousness is further supported by Milich *et al.*'s (1976) empirical findings (de Luca & Spigelman, 1979). Milich *et al.* reported that in a cafeteria (a natural setting that is socially visible), obese subjects purchased less food than non-obese subjects. This was explained by de Luca and Spigelman as being due to higher levels of self-consciousness among obese subjects. Although de Luca and Spigelman did not equate the self-consciousness theory with the motive to convey desirable impressions, Herman *et al.* (2003) suggest that self-consciousness and the motive to convey desirable images are equivalent. This is because individuals may be more aware of their own behaviour due to self-consciousness (Duval & Wicklund, 1972). In summary, various studies have shown that the differing characteristics of eating partners (for example, gender, familiarity and weight) may prompt individuals to eat less with the intention of making a good impression during an eating event.

2.3 Summary of Literature Review

The social setting influences the amount of food consumed by individuals. This chapter outlined the various effects of social setting; specifically, that when compared to eating alone, individuals consume more or less when eating in the presence of other people depending on the circumstances. In order to examine whether consumers eat more or less when all known contextual effects are controlled, hypothesis *H2* below was therefore developed. The hypothesis testing of *H2* also serves as a manipulation check for the manipulation of social setting (eating alone versus eating with other individuals).

H2: Eating in the presence of other individual(s) will cause a change in the amount consumed when compared to eating alone.

Studies have shown that consumers are less responsive to physiological cues such as hunger than non-physiological cues (Schachter et al., 1968; Stunkard & Koch, 1964) and cannot be trained to not overeat in the face of larger portion sizes (Marchiori and Papies, 2014). Not even being mindful about the effect of portion size reduces the impact of the portion size effect (Cavanagh *et al.*, 2013). Therefore, the current research aims to identify a moderator of the portion size effect in order to reduce its negative consequences. Based on Herman *et al.*'s (2003 p. 883) suggestion that despite the profound impact of the portion size effect the social effect is stronger than any other contextual cues, the current study expects that the social effect would moderate the robust effect of portion size. While Hermans et al. (2012) showed that the effects of portion size and intake of others are additive, the current research aims to examine if there is an interaction between the effects of portion size and social setting (eating alone vs. eating socially). In other words, the current research aims to examine if consumers respond differently to an increase in portion size when they are eating in the presence of other individuals compared to when they are eating alone. The following hypothesis is therefore advanced:

H3: The portion size effect will be moderated by the presence of other individuals in an eating event.

The literature review outlined in this chapter identified that portion size and social setting are the major influences on the amount of food consumed by individuals. As was outlined in Section 1.1, various personal contextual cues are found to influence the amount individuals consume. Certain personal contextual cues like hunger are reported to be less influential than the portion size and social effects. However, the current research aims to examine whether these effects may

be moderated by any of the other personal contextual cues. Although individuals' dietary restraint has been found to be unrelated to the effects of portion size (Cavanagh et al., 2014) and social modelling (Roth et al., 2001), it remains an interesting research question if restraint moderates social effect and the relationship between the effects of portion size and social setting. Bevelander et al. (2013) show that participants with higher implicit self-esteem exhibited more modelling behaviour, participants with lower body esteem portrayed more modelling behaviour and explicit self-esteem does not moderate social modelling behaviour. Focussing on the most common and comprehensive construct, the current research aims to examine is explicit self-esteem moderates the independent variables and their relationships. In order to identify the moderators of portion size and social effects, the following hypotheses were developed:

H4: Personal characteristics will moderate the portion size and social effects.

H4a: Self-esteem will moderate the portion size effect.

H4b: Restraint will moderate the portion size effect.

H4c: Self-esteem will moderate the social effect.

H4d: Restraint will moderate the social effect.

In a thorough and extensive review, Herman *et al.* (2003) identified that the extant literature on the social effect can be divided into three areas. As outlined in this chapter, they are social facilitation, social modelling and impression management. Hypothesis *H2* framed the aim of the current research in identifying whether consumers would consume more or less when eating in the presence of other individuals and when known contextual effects (for example, eating duration and eating partners' characteristics) are controlled or randomised. In other words, the current research aims to identify whether consumers have a propensity for social facilitation or impression management when eating in the presence of other individuals. Consumers who are influenced by the impact of social eating can only either facilitate their consumption (social

facilitation) or suppress their consumption (impression management). However, the current research suggests that social modelling can coexist with social facilitation and impression management. Given the fact that the social effect has always been explained by the impact of social norms, the current research expects that consumers adjust their consumption amount according to the amount consumed by the other individuals they are eating with. Despite the expectation of social facilitation or impression management among consumers eating in a social setting, social modelling is also expected to occur. Thus, the following hypothesis is proposed:

H5: The amounts eaten by individuals in a social setting will be correlated.

Lastly, since the social effect is expected to be dependent on social visibility, the relationship between portion size and social setting is expected to be dependent on social visibility. This is derived from the notion that the social setting effect depends on the strength of the social norms that consumers are exposed to. Social norms are largely determined by their social visibility; that is, the social norms have to be visible in order to be influential. Therefore, the following hypothesis is made:

H6: The relationship between portion size and social setting will be influenced by the level of social visibility.

Based on the research hypotheses outlined in this section, a conceptual model was developed and is presented below (Figure 4). The conceptual model gives a pictorial overview of the current study and also summarises the research gaps in question. In order to find answers to the research questions outlined in Section 1.2, hypothesis tests were performed and are presented in the following chapters.

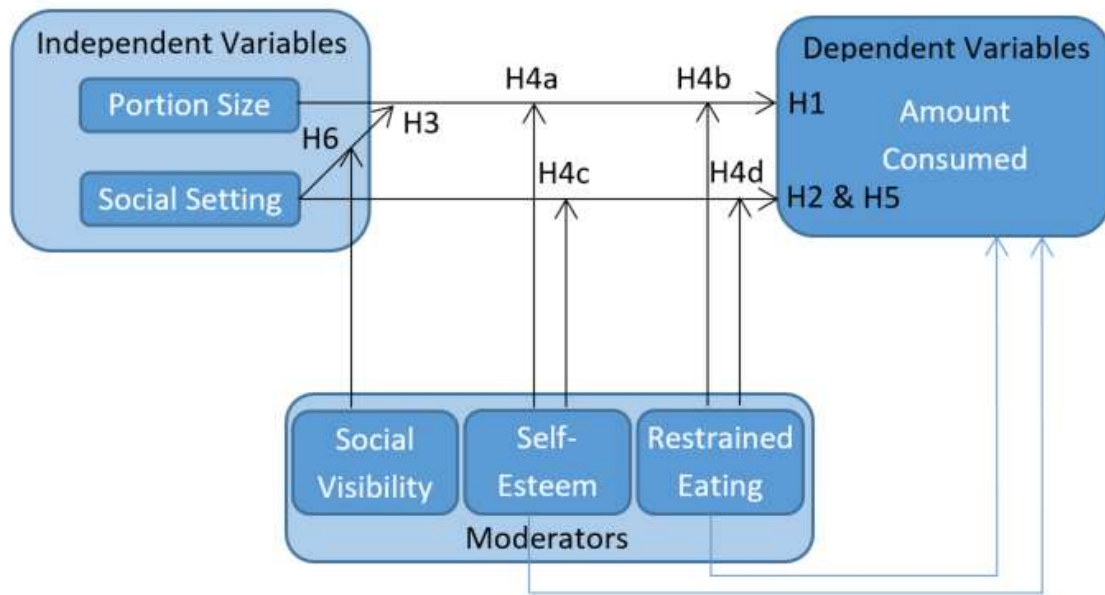


Figure 4: Conceptual Model for this Research Study

3.0 METHODOLOGY

3.1 Research Design Consideration (Study 1 and Study 2)

Numerous experiments have been conducted to study the effects of social settings on food consumption behaviour. The methodological approach in these experiments differs according to different effects of social setting (i.e. social facilitation, social modelling and impression management). Due to the aim of designing an experiment such that no specific effect of social setting is primarily expected, a number of methodological decisions had to be carefully considered during the design process of the research. The various considerations involved in designing the experiment are outlined in this chapter.

3.1.1 Experimental setting

Asking people why they eat the way they do may not provide an accurate source of information about the actual causes of their behaviour. This is because consumers are often not aware of the reasons for their behaviour. Wansink and Sobal show this in their 2007 study, where 96 per cent of the participants were not aware of the effects of contextual cues on their consumption. Consequently, Herman and Polivy (2007) suggest that an experimental method is a better way to study food consumption behaviour. Experimental psychologist researchers believe that conducting an experiment is the most effective methodology to explain a phenomenon. This is because experiments allow for the manipulation of independent variables that are hypothesised to have effects on the dependent variables. Therefore, this research examined the factors that influence the amount of food eaten using an experimental method. However, research that uses experimental methods in a laboratory setting can be overly artificial (Meiselman, 1992), especially for food consumption behaviour research data that are collected in a laboratory setting, as participants may not behave the way they would normally act if they think that their consumption is being observed. Therefore, extra care has to be taken for experimental studies to

ensure they are not artificial and, for this study, to remove the possibilities of participants being suspicious about the recording of their consumption amount. Although an observational approach within a natural setting would best replicate an actual eating event and avoid the artificial setting, there are also some disadvantages for using this approach to study consumers' food consumption behaviour. Unlike laboratory settings, natural settings are subject to various sources of noise that cannot be controlled or avoided and the observational approach within a natural setting does not allow researchers to control or manage the eating environment. Therefore, data collected in a natural setting without having any control over the eating environment would be biased towards various types of undesirable influences. These influences would thus interact with independent variables (i.e. portion size and social setting) and reduce the accuracy of the study. From the discussion of the positives and negatives of natural and laboratory study settings outlined in this paragraph, it is clear that neither the natural setting in observational method nor the laboratory setting used for experimental method is perfect.

Because there are various context effects known to change the amount people consume, the laboratory setting is used in this research in order to control as many of these context effects as possible. To avoid the experiment in the current research being overly artificial (Meiselman, 1992), the current research uses a "quasi-natural" design as suggested by Kanarek and Orthen-Gambill (1986). A quasi-natural design captures the advantages of both laboratory and natural settings while avoiding their disadvantages for a better research design. In this study, experiments were conducted in a laboratory setting that included as many naturalistic features as possible. The laboratory setting did not only allow ease in the manipulation of independent variables, it also provided good control over the eating environment. Experimental studies allow the control of a large number of various contextual cues that may affect the study results, such as consumption time, number of participants, atmosphere and all the other contextual cues outlined in Section 1.1. Naturalistic features that were included in this experiment, such as having no

confederate, no observant and incidental access to food, helped the experiments resemble eating events as naturally as possible. By doing this, the research design of the current setting capitalised on the advantages of both methods. With added naturalistic features in the laboratory setting of the current research, the accuracy of the experiment's results was ensured by keeping all contextual cues consistent across every experimental session without being overly artificial.

In order to achieve the highest possible accuracy level for food consumption behaviour, the setting of experimental research studies that use laboratory settings should replicate the actual setting of an eating event as closely as possible. As discussed earlier, the natural setting that best replicates an actual eating event is subjected to various uncontrolled and unpredictable influences. Therefore, this study took place in a classroom and used a cover story with incidental access to food to disguise the genuine research purpose. Participants will only be debriefed after researcher had concluded all related experiments of this research study, an email will be sent to the participants revealing the genuine research purpose and research outcomes. Conducting the experiment in a classroom allowed the control of various contextual cues in the experiment and the laboratory setting allowed for the manipulation of portion size and social setting while maintaining the consistency of other contextual cues such as the duration of consumption and ambience factor. The cover story and incidental access to food in the experiment allowed closer replication of an actual eating event. Lastly, between-subject design was chosen to prevent participants from identifying the independent variables being manipulated in the current research.

3.1.2 *Stimulus*

In order to avoid the ceiling effect (the minimum amount required to observe an effect) and food sharing among participants, every participant was given an individual portion of food that was large enough to be consumed during the eating session. As portion size was one of the variables being manipulated in the study, the smallest portion of food served to each participant was 48

grams of biscuits (in Study 1) and 50 grams of chocolates (in Study 2) while the largest portion was 96 grams of biscuits (in Study 1) and 100 grams of chocolates (in Study 2). By having a sufficiently large portion for the smallest portion, the floor effect can be avoided. Although visual or audio recording is the most effective mean for making sure that participants do not share their food, these forms of recordings would give rise to suspicions of the genuine research objective among participants and the feeling of their consumption being observed (e.g. Clendenen *et al.*, 1994). Therefore, no recording methods were used to check there was no sharing of food among the participants. This is a precautionary step used in the current research design to avoid participants from altering their consumption behaviour as a result of realising their consumption amount is being tracked. As well as having a sufficiently large portion of the smallest offering in the experiment, participants were asked in a questionnaire at the end of each experimental session if they were aware of any food sharing among participants. The questioning was executed with extra care; participants were led to believe that the question about portion size was intended for future improvement by making sure a sufficient amount of food was provided. All data that were collected from the sessions where participants reportedly shared their food were excluded from the analysis.

To address the possible bi-directionality of social influence on amounts consumed and in order to investigate the social effects with a more holistic approach, this study involved no confederate and the participants had no indication their consumption behaviour was being observed. This study was designed such that no single aspect of the social effect was primarily expected and aimed to extend existing understanding on the social influence and its intricacies. In addition to this, no aspect of the genuine research purpose of this study was revealed to the participants and the access to food was entirely incidental. The incidental access to food was achieved by leaving participants in the room without the researcher for five minutes with food provided to each of them in a clear plastic container on a round table as a thank you for their participation.

Participants were told that the food was offered to them as a thank you for participating in this study; they were deliberately led to believe that the food provided to them was merely to enhance the study experience. Participants had been asked to inform the researcher if they had any food allergies when they registered for the study through the Bond University website (<https://bonduniversity.sona-systems.com/default.aspx>). Participants knew that there would be snack food provided in the study, as they were told that the snack food was provided in order to make a more naturalistic and comfortable experience for them. The purpose of this deception was to prevent them from thinking there was a link between the food and the study.

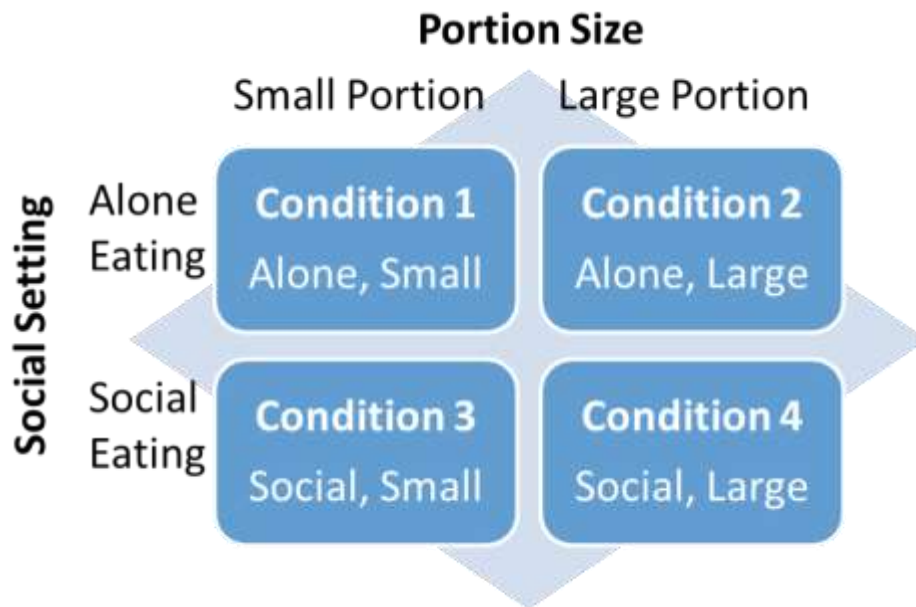
According to de Castro (1994) and Clendenen *et al.* (1994), familiarity influences the effect of social facilitation. Since the familiarity among participants across different experimental sessions will vary because participants that signed up for a particular experimental session may or may not know each other, the experiment was designed so that participants in every session would develop at least a minimum level of familiarity. The minimum level of familiarity among participants were achieved through the cover task that took place in the first 15 minutes of the experimental session. In the cover task, a series of different group activities relating to holiday destinations took place in a round table where every participant had to interact with each other. The cover task not only acted as a disguise, it also functioned to induce familiarity among participants and made sure participants in every session had some level of familiarity among themselves.

3.2 Research Design

Based on the literature review, it is clear that there is a lack of understanding on the combined effect of the portion size and social effects as well as the effect of social visibility. The current research was designed to address these research gaps. This section provides an overview of the research design of the current research. Portion size (large versus small) of the snack food

provided and social setting (social eating versus alone eating) were manipulated in this study. The current research consists of two studies that have the same research design. Both studies used a two by two between-subject experimental design, as shown in Table 2 below.

Table 2: Study 1 Experimental conditions



3.2.1 Experimental Setting

The entire duration of this experiment was approximately 30 minutes, depending on participants' progress in answering the questionnaire survey that was the final part of the experiment. The maximum time taken for one experimental session was 40 minutes and the minimum time was 27 minutes. Participants who signed up for this study thought they were participating in a research study that explored factors that influence the choice of holiday destination. This was used as the cover story to disguise the genuine purpose of this research. Every experimental session began with a focus group study lasting 15 minutes, which served as the purpose of the above-mentioned cover story. The focus group study included a series of activities and discussions related to holiday destination preferences. The discussions and activities were designed so that every participant had to interact with the other participants. As well as working as a cover story, the

focus group study was also used to induce familiarity among all participants. The duration of the focus group study was kept consistent at 15 minutes for every experimental session. By doing so, participants across all experimental sessions would achieve a similar minimum level of familiarity among themselves. Although the focus group study was led by the researcher, the researcher was not involved in any activity or the discussion of the focus group study. The researcher stood by the participants and allegedly took down notes from their discussions. The researcher was deliberately excluded from the discussions and activities in order to encourage interactions among participants and to prevent participants from interacting only with the researcher. This was another countermeasure used to ensure interactions and hence a certain level of familiarity among participants.

3.2.2 *Stimulus*

The independent variables in each study were portion size and social setting and the dependent variable was the amount consumed by participants. The effect of social visibility was tested by comparing Study 1 and Study 2, which had different levels of social visibility. Social visibility was manipulated by using two different types of snack food that differ in size (biscuits versus chocolates). The small size snack food makes it more difficult to see what others are consuming and thus reduces the social visibility. In order to ensure that the variations of the dependent variable is explained by the manipulation of the independent variables but not the other factors, all of other known contextual cues outlined in Chapter 1.0 were either measured or controlled. Participants were randomly assigned to one of the four experimental conditions, which were a result of the manipulation of two independent variables in the experiment design: large portion versus small portion and the alone eating versus social eating.

The experiment was repeated with different food types, with the different food types used to generate two different visible levels of consumption behaviour. Biscuits (Arnott's Nice biscuits)

were served to the participants in Study 1 and chocolates (M&M's) were served to the participants in Study 2. As the visibility level for consuming an Arnott's Nice biscuit is higher than consuming an M&M's chocolate due to the larger size of the biscuit, Study 1 has higher level of social visibility than Study 2. Participants were allowed to participate in the current research only once. This was ensured by not allowing participants of either study (Study 1 or Study 2) to sign up twice. The number of participants in every session was kept consistent, with only four participants allowed in each session. To control these requirements, an online registration system that allows registration monitoring and management (developed by Sona Systems) was used to recruit participants for this research. To allow the awarding of bonus marks for participation and future debriefs, participants had to create an account which required them to provide information including but not limited to their student ID number, telephone number and email address. This research was promoted to students at Bond University through announcements made in different lecture sessions by the researcher who conducted the experimental session. One credit point was offered to each participant as a bonus mark for one of their enrolled and eligible subjects to encourage participation. Since one credit point is an insignificant form of incentive, the current research did not expect biased results as a consequence of the incentive offered to participants as an encouragement for participation.

Snack food was only offered to participants after the focus group study, when participants were left in the room with snack food for five minutes without the presence of researcher, who had left the room. Snack food was deliberately placed out of sight of participants before this time in order to avoid the trigger of hunger or appetite that results from the smell or sight of food. Participants were deliberately left in the room without the presence of the researcher in order to prevent the participants from feeling that their consumption of snack food would be monitored by the researcher. Participants were told that researcher had to leave the room for a while and prepare for the next part of this study; on top of this, participants did not know when the researcher would

return. Each participant was offered an individual container of snack food of which the lid had been opened earlier by the researcher. Depending on the experimental condition, participants either sat together at a round table or sat separately in partitioned spaces at the corners of the room. In order to avoid participants who sat alone separately after the cover study which involved group interactions feeling awkward, a poster related to the cover study was provided so they would have something to look at while eating.

In addition to the social setting manipulation described in previous paragraph, the food portion size was also manipulated in order to examine how these two important contextual cues interact with each other. Participants in each experimental session either ate alone or ate in a group and they were either given a small or large portion of snack food depending on the experimental condition they were assigned to. Portion size and social effects are important contextual cues that have a profound impact on the amount of food an individual consumes (e.g. Herman & Polivy, 2005). These contextual cues can be present in an eating event simultaneously; however, the relationship between the portion size effect and the social effect has not been well explored in the existing literature. Although Hermans *et al.* (2012) examined the relationship between portion size effect and social modelling effect and reported no interaction between these two contextual cues, their study focused only on a specific effect of social eating, which is the social modelling effect. The current research examines this relationship without focusing on a specific effect of social eating. Unlike Hermans *et al.*'s research, the current research did not use a confederate in the experiment and none of the participants were asked to consume a predetermined amount of food.

In the following chapters, Chapter 4.0 and Chapter 5.0, two studies of the current research will be outlined in detail. The research objectives, procedures, measures, results and discussion of

each study can be found in Chapter 4.0 and Chapter 5.0 followed by a general discussion in Chapter 6.0 that compares the findings in both studies.

4.0 STUDY 1 – HIGH SOCIAL VISIBILITY CONDITION

4.1 Research Objectives

The main objective of the current study is to examine the combined effect of two major contextual cues, portion size (large portions versus small portions) and social setting (eating in a group versus eating alone) on the amount consumers consume. Portion size and social setting are two of the most important contextual cues that influence consumption amount. However, the relationship between these two crucial contextual cues remains largely unexplored. Therefore, the current study aims to close this research gap by investigating how one contextual cue affects the impact of another contextual cues.

In addition to examining the relationship between portion size and social setting, this study aimed to identify the possible moderators of the main effects of these two contextual cues. As discussed in Section 1.1, there are many contextual cues known to influence how much individuals consume. All known food contextual cues and consumption contextual cues that were not manipulated as independent variables were controlled in this study to ensure they do not account for the variation of the dependent variable, which is the amount of food consumed by individuals. Meanwhile, all known personal contextual cues were measured to be examined as possible moderators of the main effects. Personal contextual cues that were measured in this study include participants' mood, desire for status, self-esteem level, restrained eating level, impulsivity, BMI, hunger and how much they like the food provided to them. Using the questionnaire method, participants were asked to rate the above-mentioned personal contextual cues at the end of the experimental session. The measured personal contextual cues were examined for possible moderators of the main effects in the current study.

The current study explores whether the amounts consumed by individuals who are eating in a social setting will be correlated (i.e. social modelling). Social modelling as reported in the extant literature has always been determined by examining the empirical evidence obtained by running experiments consisting of two individuals eating together. The current study aims to examine if social modelling can be found when more than two individuals are eating together.

Investigating the directionality of the social effect is also another research objective of the current study. The literature review in Chapter 2.0 shows that mixed results of the social effect have been reported in the extant literature, as different studies have shown that eating in a social setting may both increase and decrease the amount consumed by individuals. Herman *et al.* (2003, p. 883) conclude that eating in the presence of other individual(s) can cause individuals to either increase or reduce their consumption amount depending on the circumstances. For example, if social facilitation studies in the existing literature include sufficient participants with highly restrained eating levels, it is generally expected that the suppression effect will outweigh the facilitation effect. Apart from the fact that strength of social facilitation effect is moderated by the level of familiarity among participants, eating in a group can also cause individuals to reduce their consumption levels under certain circumstances. Studies that are labelled as impression management show that individuals suppress the amount they consume when they are eating in the presence of other individuals who are perceived to be observing or judging their consumption. Social modelling literature also shows that the direction of the social effect is circumstantial. In a social modelling study, the amount consumed by participants depends on the norms (either augmenting or inhibiting) invoked by confederates in the experiments. Although the social effect is arguably the most influential contextual cue that affect individuals' consumption amount, the bi-directionality of the social effect contributes to the inconclusiveness of its impact. For example, does eating in a social setting help consumers to better regulate the amount they consume? Consequently, applying the implications of the social effect found in the large number

of experiments becomes a challenge. Hence, the current study aims to better understand the effect of social setting in a regular eating event by investigating the directionality of social effects.

4.2 Research Methodology – Study 1

4.2.1 Research Procedure

The procedure used for Study 1 followed the stages listed in Figure 5 below.

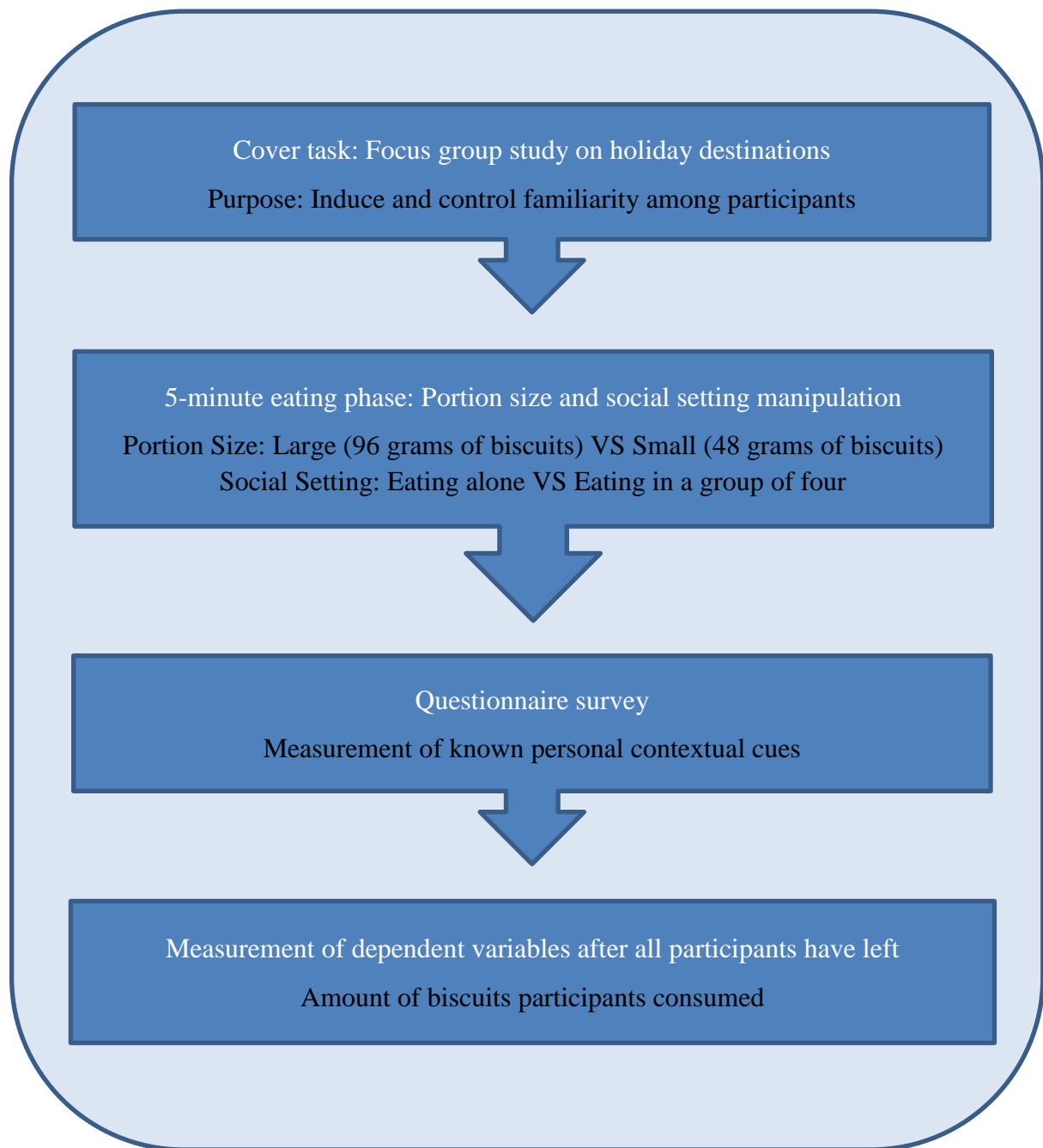


Figure 5: Procedure for Study 1

This study was conducted over three months from February 2014 to April 2014 during weekdays between 10am and 6pm. There were 322 participants in this study and they were all Bond University students. Among the 322 participants, 163 were male and 159 were female, 237 were undergraduate students and 85 were postgraduate students. To disguise the true intention of the study, a cover story was used; participants were invited to take part in an unrelated survey and were given incidental access to food. Participants did not know that the study was a study of food consumption behaviour; therefore, the possibility of participants behaving unnaturally resulting from the knowledge of their consumption amount being recorded was eliminated. All studies described and reported in the current research were approved by the Bond University Research Ethics Committee (BUHREC), ethics reference number: RO1736. The ethical considerations of the current research were addressed in accordance with Bond University's policy on ethical research as specified in the National Statement on Ethical Conduct in Research Involving Humans by the Australian Government.

For the cover story, participants were told that the current study is a study investigating factors that influence consumers' behaviour on their choice of holiday destination. Every participant signed up for the experiment on a voluntary basis and was awarded 1% course credit for completing this study. In order to sign up for this study, participants had to log on to a website (<https://bonduniversity.sona-systems.com>). For the purpose of sending reminder messages to participants and keeping a record of their participation in order to award them with course credit, participants had to register for an account in the website providing their details. A number of different experimental sessions were available to be chosen from the website daily. Upon successful registration, participants were allowed to pick an experimental session from the list of different available experimental session times. Participants were only allowed to sign up for one session.

Social facilitation studies in the extant literature that incorporated a natural setting in their experimental design invited four participants in an experimental session to resemble a social eating condition (e.g. Berry *et al.*, 1985; Clendenen *et al.*, 1994; Edelman *et al.*, 1986). Based on the method employed in these empirical studies' method, the social eating experimental condition in the current research also has four participants in each experimental session so that the experiment resembles a common eating event. It was decided to keep the number of participants at four in every experimental session in order to avoid the possibility of introducing extraneous variables. This is to avoid having groups of different sizes which could explain the variation of independent variables in the current research. Hence, every session had four participants in all four different experimental conditions. Any experimental session that had fewer than four participants sign up was cancelled and participants were notified via email and short text message prior to the session. All sessions that were conducted with fewer than four participants, including cases where participants did not show up for the experimental session, were excluded from the analysis. By doing this, the current study eliminated the possibility of explaining the variation of consumption amount with the number of participants in the experimental sessions.

As soon as the participants arrived at the experimental study venue, they were asked to switch their mobile phones into silent mode and place them in a storage area along with all of their other belongings. Participants were asked to sit at a round table while waiting for other participants to arrive. The storage area was located next to the round table; as shown in Appendix F, the storage area was covered with a large cloth when all participants arrived and stored their belongings in it. Doing this prevents participants from using their mobile phones and electronic devices or accessing any personal belongings. This is crucial as these may act as extraneous variables of the experiment and cause inaccuracy in the collected data.

Each participant was given a randomly allocated seat at the round table with their name tag in place (the setting of the round table is shown in Appendix F). Once all four participants had arrived, the researcher conducted the experimental session following the script attached in Appendix G. The participants were told that the experimental session would begin with a group discussion and that the researcher would not be part of the group discussion and would only stand by the group taking notes from their discussions. After the researcher introduced himself to the group of participants, participants were asked to introduce themselves to the other participants. The researcher then gave them the first topic, entitled “The Most Wanted Holiday Destination”, to be discussed among themselves. Participants were then asked to work in a group and list the Seven Wonders of the World. Following the first group activity, participants were asked to have a discussion among themselves and come up with a consensus in the group of the five best holiday destinations within Australia in descending order. With the group effort, participants were then asked to list 10 countries in Asia and 10 countries in Europe. Lastly, participants were asked to share their most enjoyable holiday experience with other group members. These group discussions and activities ensured the involvement of every participant and prompted interactions among participants. These group discussions and group activities, which were used as a cover task to disguise the genuine research and induce familiarity among participants, lasted 15 minutes in every experimental session.

After the 15-minute group discussions and activities, participants were moved to the next stage of the experiment: the eating phase. Depending on the experimental condition (either social eating or eating alone), participants were either sitting together at a round table adjacent to the one at which they performed the cover task or sitting in separate cubicles. In both experimental conditions (social eating or eating alone), each participant was served with a clear plastic container of biscuits with the lid opened for the participants by the researcher (refer Appendix A). The biscuits served to the participants were Arnott’s Nice biscuits (shown in Appendix A).

Each container was weighed before and after the experiment using a Salter 1066 electronic kitchen scale. In large portion size condition, 96 grams (8 pieces) of biscuits were served; in small portion condition, 48 grams (4 pieces) of biscuits were served. [All participants in a session get the same portion size.](#) The containers of biscuits were not prepared and set up in the beginning of the experimental session; they were kept away from participants' vision in a storage bag behind a table in order to avoid the unwanted trigger of hunger resulting from the sight and smell of the biscuits. The researcher alone began to set up the containers of biscuits on the round table adjacent to the one at which participants performed the cover task.

The eating session immediately followed completing the related tasks of the cover story. For each eating session, the participants were assigned either a large portion or a small portion. In addition to adjusting the portion size, the social settings were also manipulated so that participants were either eating alone or eating in a group. Participants were randomly assigned to one of the following four conditions resulting from the two (portion size: small, large) by two (social setting: alone eating, social eating) between subject design as shown in Table 2 above. During the eating phase, the researcher left the room on the pretext of preparing for the next part of the research session so that the participants would not feel that they were being observed while eating. Participants were told that the biscuits were given to them as a thank you for taking part in this experiment and they could have as many as they like. For the social eating condition, participants were told that while enjoying the biscuits provided to them they could interact and converse with the other participants who were sitting together with them at the round table. For the eating alone condition, participants were asked to sit and eat in a cubicle with no interaction or conversation with the other participants who were also separated into cubicles. They were also reminded not to use the computer stationed in the cubicles until instructed. Participants in the eating alone condition were also told that there was a poster of the Seven Wonders of the World in each cubicle (as shown in Appendix H) which they could read. In order to ensure participants

in the eating alone condition ate in isolation, signs of “please remain silent” (as attached in Appendix I) were pasted on the wall of each cubicle.

For all experimental conditions, the researcher returned to the room after five minutes and asked the participants to answer a questionnaire using the computers stationed in each cubicle. Participants, who were still unaware of the genuine research purpose of the current study, were asked to complete a questionnaire that continued the cover story of the holiday destination theme but also included questions about the biscuits provided. The questionnaire included manipulation checks on the serving sizes and all known personal contextual cues that could possibly be the moderators of the main effects. The details of personal contextual cues measures are outlined in Section 4.2.2 below and an actual version of the questionnaire is also attached in Appendix K.

Before the study, the computers in the cubicles were prepared for the questionnaire survey and then put into screensaver mode displaying the message “Please do not use the computer until instructed.” Participants in the social eating condition stood up and moved to the cubicles at the corners of the room and began to answer the questionnaire. Participants in the alone eating experimental condition moved to the table next to the one they sat on within the same cubicle and began the questionnaire. At this point, all the containers of biscuits were collected and weighed out of sight of the participants. The questionnaire was the last part of the experimental study; as soon as a participant completed the questionnaire, the participant was reminded to collect their belongings before leaving the venue.

4.2.2 Measures of Personal Contextual Cues

Using experimental design, all known food contextual cues were controlled and the portion size was manipulated. Similarly, all known consumption contextual cues were controlled by the experimental design while the social setting was manipulated. Since participants’ personal

contextual cues cannot be controlled or manipulated, they were measured to make sure that the contextual effects were due to the manipulated independent variables and not caused by personal contextual cues. Below are the scales that were used to measure participants' personal contextual cues. These chosen scales have been used extensively in the literature and have clearly demonstrated excellent measurement properties.

4.2.2.1 Mood

Mood has been shown to influence consumers' consumption amount (Patel & Schlundt, 2001). The Positive and Negative Affect Scale (PANAS: Watson, Clark, & Tellegen, 1988) was used to measure participants' mood. Cronbach's alpha was 0.838.

4.2.2.2 Desire for Status

Participants' desire for status was measured using the Need for Status scale. (Dubois *et al.*, 2012). Cronbach's alpha was 0.877.

4.2.2.3 Self-Esteem

Participants' self-esteem level was measured with Rosenberg's Self-Esteem Scale (Rosenberg, 1965). Cronbach's alpha was 0.904.

4.2.2.4 Restrained Eating

The restrained eating subscale of the Dutch Eating Behaviour Questionnaire (DEBQ-R) (van Strien, Frijters, Bergers, & Defares, 1986) was used to measure if participants have restrained patterns in their consumption pattern. Cronbach's alpha was 0.898.

4.2.2.5 Impulsivity

The impulsivity of participants was measured using the motor impulsiveness subscale of the Barratt Impulsiveness Scale (Patton, Stanford, & Barratt, 1995) that examines how much a person “acts on the spur of the moment.” The scale consists of seven items rated on a four-point scale of intensity. Cronbach’s alpha was 0.766.

4.2.2.6 BMI, Hunger and Liking of Food

The body mass index (BMI) of participants was calculated based on the participants’ self-reported height and weight by dividing their weight in kilograms (kg) with their height in metres squared (m²). Participants’ hunger level before and after the experimental session and their liking of the biscuits were measured using a 100-point scale of intensity.

4.2.2.7 Rapport

The group rapport level among participants was measured using an eight-point Likert scale that asked participants to indicate the rapport level among all members in the group. Due to the vagueness of the concept of rapport, a definition of the term adapted from Grahe and Bernieri (2002) was given to participants prior to the question.

4.2.2.8 Comfort

Participants’ comfort level during the social interactions in a group of four people was measured using the measure of comfort scale (Frable, Blackstone, & Scherbaum, 1990). Cronbach’s alpha was 0.639.

4.3 Results - Study 1

As outlined in Section 3.2, the number of participants were kept consistent at four across every experimental session in order to avoid the possibility of a dependent variable being explained by a variation in the participation number. Thus, among the 83 experimental sessions that were conducted, a total of eight sessions that had fewer than four participants due to their absence or late arrival were excluded from the analysis. As a result, 22 participants among the original 322 participants in Study 1 of the current research were removed from the analysis. Before the hypothesis testing, manipulation checks were first conducted to confirm that experimental conditions were not characterised by other contextual cues. This was to ensure that the variations of the dependent variables were explained by the independent variables instead of some other contextual cues. SPSS version 23 statistical analysis software was used as the statistical analysis tool.

In order to show that the main effects are explained by the manipulated variables instead of other potential sources like participants' self-esteem or restraint level, mean comparison tests were carried out. Mean comparison tests were conducted to check that the mean values of these contextual cues were not significantly different across experimental conditions in order to make sure the experimental conditions were not the result of these alternate variables. The ANOVA tests summarised in Table 3 below shows that the mean value for participants' self-esteem level is not significantly different across different experimental conditions. Participants eating in a group and eating alone had similar self-esteem level ($\text{Mean}_{\text{Eating in a group}} = 30.5000$; $\text{SD} = 5.91683$; $\text{Mean}_{\text{Eating alone}} = 30.8738$; $\text{SD} = 5.13438$; ANOVA's test $F(1,205) = 0.104$, $p = 0.748$). The mean value for participants' self-esteem were consistent across those two other experimental conditions of different portion sizes ($\text{Mean}_{\text{Large portion}} = 30.7653$; $\text{SD} = 6.04587$;

$\text{Mean}_{\text{Small portion}} = 30.3761$; $\text{SD} = 5.54074$; ANOVA's test $F(1,205) = 0.234$, $p = 0.629$).

Therefore, the experimental conditions are not characterised by participants' self-esteem level.

Table 3: Mean value of participants' self-esteem across different experimental conditions (Study 1)

Experimental Condition	N	Mean	Std Dev	Comparison p-value
Eating alone	37	30.8738	5.13438	0.748
Eating in a group	170	30.5000	5.91683	
Small Portion	109	30.3761	5.54074	0.629
Large Portion	98	30.7653	6.04587	

Instead of aggregating the amount consumed by all subjects eating in a social setting, every subject in the social eating experimental condition was treated as a single observation. Therefore, the number of observation for social eating experimental condition ($N = 170$) is larger than the number of observation for eating alone experimental condition ($N = 37$). As summarised in Table 4, the ANOVA test showed that the mean value for participants' restrained eating levels was not significantly different across different experimental conditions. Participants who were assigned to the experimental condition where they ate in a group had the same mean value of restrained eating level as participants who were assigned to the experimental condition where they ate alone ($\text{Mean}_{\text{Eating in a group}} = 2.6350$; $\text{SD} = 0.92604$; $\text{Mean}_{\text{Eating alone}} = 2.5691$; $\text{SD} = 0.75868$; ANOVA's test $F(1,205) = 0.164$, $p = 0.686$). The mean value for participants' restrained eating level was also consistent across the experimental conditions of different portion sizes ($\text{Mean}_{\text{Large portion}} = 2.6565$; $\text{SD} = 0.97772$; $\text{Mean}_{\text{Small portion}} = 2.5934$; $\text{SD} = 0.82128$; ANOVA's test $F(1,205) = 0.254$, $p = 0.615$). Therefore, the experimental conditions are not characterised by participants' restrained eating level.

Table 4: Mean value of participants' restraint across different experimental conditions (Study 1)

Experimental Condition	N	Mean	Std Dev	Comparison p-value
Eating alone	37	2.5691	0.75868	0.686
Eating in a group	170	2.6350	0.92604	
Small Portion	109	2.5934	0.82128	0.615
Large Portion	98	2.6565	0.97772	

From the one-way ANOVA tests shown above, participants' personal characteristics were not statistically different across all four different experimental conditions. Therefore, the current study concludes that the measured variation of consumption amount was due to the independent variables but was not due to participants' personal contextual cues. After making sure that the experimental conditions were not characterised by participants' self-esteem and restraint, hypothesis testings were conducted. A discussion of the main findings is in Section 4.4.

The manipulation check for portion size did not work due to a questionnaire error. The questionnaire did not ask for participants' opinion about the portion size, participants were instead asked if they think that the portion size was large enough as a standard size serving. As a result, participants' opinion on the portion size were not statistically different across the experimental conditions (large portion and small portion). This error was corrected in Study 2 and the manipulation check for portion size effect in Study 2 was successful (see Section 5.3). In order to ensure that portion size was also successfully manipulated in Study 1, portion size effect was checked, the amounts consumed by participants in the large portion condition and the small portion condition were compared. Only data obtained from participants in the eating alone condition were included in this manipulation check in order to avoid the other independent variable from interacting with the effect of portion size. The ANOVA test summarised below

shows that the portion size was successfully manipulated as an independent variable. Participants in the small portion experimental condition consumed less than participants in the large portion experimental condition ($\text{Mean}_{\text{Small Portion}} = 21.6087$; $\text{SD} = 17.44795$; $\text{Mean}_{\text{Large Portion}} = 34.7857$; $\text{SD} = 19.24010$; ANOVA's test $F(1,35) = 4.595$, $p = 0.039$)

Table 5: Mean value of participants' consumption across different portion size conditions (Study 1)

Experimental Condition	N	Mean	Std Dev	Comparison p-value
Small Portion	23	21.6087	17.44795	0.039
Large Portion	14	34.7857	19.24010	

4.3.1 Summary of Research Hypotheses

Based on the research objectives and the identified research gaps, five research questions were developed and outlined in Section 1.2. Six research hypotheses were derived from the literature review. However, Study 1 only tests five hypotheses (as summarised in this section). The last hypothesis concerning social visibility will be tested by comparing the results in Study 1 and Study 2. In order to close the research gaps identified in this research, the hypotheses were tested and are presented in the following section, Section 4.3.2. The hypotheses are discussed below.

H1: Increasing the portion size will result in an increase in the amount consumed.

The robust effect of portion size has been shown in numerous studies and is widely recognised. As portion size is manipulated in the study design, it is expected that individuals will consume more when they are given a larger portion. Due to the possible interaction between the portion size and social effects, the manipulation check based on hypothesis *H1* was tested without including the data obtained from social eating condition.

H2: Eating in the presence of other individual(s) will cause a change in the amount consumed when compared to eating alone.

The social effect has shown both a facilitating and suppressing influence on amounts consumed. The effect of social setting has been widely recognised but the directionality of this effect remains unclear. Therefore, this study expects to see a significant social effect and aims to investigate its direction; in particular, the effect when a social setting is arranged with naturalistic features and is neither in a completely natural setting (for example a restaurant) nor in a completely sterile lab environment. In this research, there are no confederates involved. Instead, the participants are allowed to reach their own levels of consumption without guidance or input from the researcher.

H3: The portion size effect will be moderated by the presence of other individuals in an eating event.

The effects of contextual cues that can coexist simultaneously are studied in this study. Both the effects of portion size and social setting have been recognised as two of the most important contextual cues that influence the amount of food consumed by individuals. This study explores whether there is an interaction effect between the two contextual cues and hopes to lay some groundwork in studying the relationship between these two important contextual consumption cues. The effect of social eating is suggested to be stronger than any other contextual cues (Herman *et al.*, 2003 p. 883). Hence, the current study hypothesises that the portion size effect will be moderated by the social effect.

H4: Personal characteristics will moderate the portion size and social effects.

H4a: Self-esteem will moderate the portion size effect.

H4b: Restraint will moderate the portion size effect.

H4c: Self-esteem will moderate the social effect.

H4d: Restraint will moderate the social effect.

Self-esteem is known to be an antecedent to the need for social acceptance (Robinson *et al.*, 2011). This suggests that self-esteem may have an impact on how people react to food, whether alone or in a group. While a large main effect for self-esteem is not expected, it is expected that it may moderate both portion size and social eating effects.

Restrained eating is also expected to moderate both social and portion size effects due to the nature of dieters. Specifically, Herman *et al.* (2003, p. 874) suggests that restrained eaters may be monitoring others' eating and gauging their own consumption based on what others have consumed. If this is true, then restraint should interact with social eating. It is not clear whether restraint moderates the portion size effect and thus whether this interaction takes place.

H5: The amounts eaten by individuals in a social setting will be correlated.

A number of studies have shown the tendency of individuals modelling the amount consumed on other individuals who are eating together (e.g. Conger *et al.*, 1980; Hermans *et al.*, 2012a; Johnston, 2002). Social effects have always been explained by individuals complying with social norms (see Herman *et al.*, 2003); therefore, it is expected that the amount eaten by other individuals who are eating together would set a norm for the appropriate amount of food to be consumed. However, social modelling has always been shown in experiments consisting of two individuals eating together. Besides studies that use two acquainted models (Howland, Hunger,

& Mann, 2012) and multiple remote confederates (e.g. Leone et al., 2007; Roth et al., 2001), social modelling has always been studied dyadically. The current study aims to examine if social modelling can be found among four individuals who are eating together.

4.3.2 Hypothesis testing

Hypotheses *H1* and *H2* were tested by examining whether there is a main effect of social setting and portion size. Hypothesis *H3* was tested by examining if there is an interaction between the two independent variables. Hypothesis *H4* was tested by examining if restraint and self-esteem interact with independent variables. Hypothesis *H5* was tested by examining if the amounts consumed by participants in an experimental session are correlated.

Hypotheses *H1*, *H2*, *H3* and *H4* were tested by using the GLM (General Linear Model) in SPSS. The dependant variable, the amount consumed by participants, was included as *Dependant Variable* in the model. The independent variables, social setting and portion size were included as *Fixed Factors(s)* in the model. Participants' self-esteem score, which ranges from 10 to 40, was divided into three groups (10-29, 30-33 and 34-40) and was also included into the model as *Fixed Factors(s)* for spotlight analysis. Participants' restrained eating levels were included as *Covariate(s)*. It is important to note that variables that were included as *Covariate(s)* *General Linear Model* do not have the common meaning of the covariate, which generally refers to variables that are of no interest in the study but need to be controlled. Instead, these variables are of the most interest to the study, just like the independent variables. Although there are many other variables that this research has measured (i.e. mood, desire for status, impulsivity, weight, hunger, liking of food, rapport and comfort), they were not included in the *Covariate* slot of *General Linear Model*. This is because the current study aims to investigate if participants' restrained eating level moderates the main effect. Consequently, the model of the analysis is shown as below:

$$\begin{aligned} \text{Consumption Amount} = & \text{Social Setting} + \text{Portion Size} + \text{Self-Esteem} + \text{Restrained Eating} + \\ & (\text{Portion Size} * \text{Restrained Eating}) + (\text{Self-Esteem} * \text{Restrained Eating}) + (\text{Social Setting} * \\ & \text{Restrained Eating}) + (\text{Portion Size} * \text{Self-Esteem}) + (\text{Social Setting} * \text{Portion Size}) + (\text{Social} \\ & \text{Setting} * \text{Self-Esteem}) + (\text{Portion Size} * \text{Self-Esteem} * \text{Restrained Eating}) + (\text{Social Eating} * \\ & \text{Portion Size} * \text{Restrained Eating}) + (\text{Social Setting} * \text{Self-Esteem} * \text{Restrained Eating}) + (\text{Social} \\ & \text{Setting} * \text{Portion Size} * \text{Self-Esteem}) \end{aligned}$$

Due to the uneven distribution of participants' self-esteem level in the current study, spotlight analysis (Fitzsimons, 2008) was used in the analysis to avoid unnecessary error in analysis. The data were equally divided into three groups based on participants' self-esteem level; in order to tease out the effect of self-esteem, only the extreme ends of the data groups (those with either high or low level of self-esteem) were included in the analysis. The parameter estimates obtained from the GLM analysis are presented in Table 6 below.

Table 6: Parameter Estimates Study 1

	Parameter	B	t	Sig.	Observed Power ^b
	Intercept	36.475	5.021	0.000	0.999
	Self-Esteem	-17.478	-1.721	0.087	0.402
	Restraint	-3.409	-1.264	0.208	0.242
<i>H1</i>	Portion Size: Small	-18.077	-1.643	0.102	0.373
<i>H2</i>	Social Setting: Alone	71.456	2.511	0.013	0.705
<i>H3</i>	(Portion Size: Small)*(Social Setting: Alone)	-48.898	-1.875	0.062	0.463
<i>H4a</i>	(Portion Size: Small)*(Self-Esteem: Low)	18.206	1.231	0.220	0.232
<i>H4b</i>	(Portion Size: Small)*Restraint	3.228	.757	0.450	0.117
<i>H4c</i>	(Social Setting: Alone)*(Self-Esteem: Low)	-39.359	-1.380	0.169	0.279
<i>H4d</i>	(Social Setting: Alone)*Restraint	-18.221	-2.015	0.045	0.518
	(Self-Esteem: Low) * Restraint	2.881	0.800	0.425	0.125
	(Portion Size: Small) * (Self-Esteem: Low) * Restraint	-1.398	-0.259	0.796	0.058
	(Social Setting: Alone) * (Portion Size: Small) * Restraint	8.962	1.051	0.295	0.182
	(Social Setting: Alone) * (Self-Esteem: Low) * Restraint	10.804	1.184	0.238	0.218
	(Social Setting: Alone) * (Portion Size: Small) * (Self-Esteem: Low)	13.163	0.939	0.349	0.155

Based on the parameter estimates presented in Table 6 above, hypothesis *H1* is not supported. This signifies that the portion size effect found in other studies was not detected in Study 1 of the current research. However, this may well be due to its interaction with the other independent variables (i.e. the social setting). Therefore, the hypothesis testings are repeated in Section 4.3.3 without including the data of individuals eating in a social setting. In Section 4.3.3, it was found that the portion size effect was detected in Study and that the portion size effect was masked by the social effect.

The results also show that individuals' consumption was affected by both of the social settings (alone eating versus social eating); therefore, the manipulation of social setting has been proven successful. This is shown by hypothesis *H2* being supported in the GLM analysis.

In addition to this, the effect of portion size was shown to be moderated by social effect. The results show a significant interaction effect between portion size and social setting; therefore, hypothesis *H3* is supported. That is, the influence of the portion size (a small portion versus a large portion) on the total consumption amount of an individual depends on the social setting (alone eating versus social eating) of an eating event. Hypothesis *H4d* is also supported; however, hypotheses *H4a*, *H4b* and *H4c* are not supported. Therefore, restraint (but not self-esteem) moderate the effects of social setting, while the portion size effect was moderated by neither restraint nor self-esteem.

In order to examine if the amount consumed by individuals eating in a social setting is correlated, hypothesis *H5* was tested by conducting correlation tests on the amounts consumed by participants. Every participant was labelled by the seat number that they were randomly allocated to. Participants who sat at seat number 1 are labelled as Participants_1 and the same applies to all other participants. Participants that sat at seat numbers 2, 3 and 4 are labelled as

Participants_2, Participants_3 and Participants_4 respectively. From the correlation results shown in Table 7 below, the consumption amounts between Participants_1 and Participants_2 are not correlated. This was due to the high variance level of Participants_2's consumption amounts compared to other participants as shown in Table 7 below.

Table 7: Correlation Tests (Study 1)

		Participants_1	Participants_2	Participants_3	Participants_4
Participants_1	Pearson Correlation	1	0.185	0.348**	0.542**
	Sig. (2-tailed)		0.158	0.006	0.000
	N	60	60	60	60
Participants_2	Pearson Correlation	0.185	1	0.287*	0.281*
	Sig. (2-tailed)	0.158		0.026	0.030
	N	60	60	60	60
Participants_3	Pearson Correlation	0.348**	0.287*	1	0.318*
	Sig. (2-tailed)	0.006	0.026		0.013
	N	60	60	60	60
Participants_4	Pearson Correlation	0.542**	0.281*	0.318*	1
	Sig. (2-tailed)	0.000	0.030	0.013	
	N	60	60	60	60

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Compared to other participants, Participants_2's consumption amounts has three to six standard deviations more (see Table 8 below) compared to other participants in one experimental session. Based on these findings, two outliers were identified among Participants_2. These outliers that were identified through a scatter plot consumed more than the amounts consumed by all other participants. Therefore, two experimental sessions which included the outliers were excluded from the correlation tests to reduce the standard deviation of Participants_2.

Table 8: Variance levels of participants' consumption (Study 1)

	Participants_1	Participants_2	Participants_3	Participants_4
Mean	21.1833	22.9000	20.7000	17.7500
N	60	60	60	60
Std. Deviation	13.99333	19.05096	16.06269	13.23788
Variance	195.813	362.939	258.010	175.242

As a result of removing the two experimental sessions consisting of outliers from the correlation tests, only 58 experimental sessions (232 participants) were included in the correlation tests that examined for social modelling. As shown in Table 9, excluding the outliers from the correlation tests improved the correlations almost to significance. The consumption amounts between Participants_1 and Participants_2 were correlated, while the correlation (0.108) between Participants_2 and Participants_3 were almost significance (just over 0.100). Thus, hypothesis *H5* is supported in Study 1; the amounts eaten by individuals in a social setting are correlated.

Table 9: Correlation Tests – Study 1 (Outliers removed)

		Participants_1	Participants_2	Participants_3	Participants_4
Participants_1	Pearson Correlation	1	0.261*	0.356**	0.540**
	Sig. (2-tailed)		0.048	0.006	0.000
	N	58	58	58	58
Participants_2	Pearson Correlation	0.261*	1	0.213	0.343**
	Sig. (2-tailed)	0.048		0.108	0.008
	N	58	58	58	58
Participants_3	Pearson Correlation	0.356**	0.213	1	0.315*
	Sig. (2-tailed)	0.006	0.108		0.016
	N	58	58	58	58
Participants_4	Pearson Correlation	0.540**	0.343**	0.315*	1
	Sig. (2-tailed)	0.000	0.008	0.016	
	N	58	58	58	58

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

The mean values of participants' consumption amount, restraint and self-esteem across all four experimental conditions are summarised in Table 10 below. From the mean comparisons table below, it is shown that the portion size effect is larger when individuals are eating alone compared to individuals eating in a group. Participants' restraint and self-esteem levels are consistent across all experimental conditions.

Table 10: Mean comparisons - Study 1

Social Setting	Portion Size	Consumption (g)	DEBQ-R	Self-Esteem
Alone Eating	Small Portion (n=23)	21.6087 (3.63815)	2.5454 (0.13345)	31.3043 (1.05844)
	Large Portion (n=14)	34.7857 (5.14213)	2.6079 (0.25329)	30.0714 (1.42376)
	Total (n=37)	26.5946 (3.12657)	2.5691 (0.12473)	30.8378 (0.84409)
Social Eating	Small Portion (n=86)	20.8488 (1.59509)	2.6062 (0.09340)	30.1279 (0.61040)
	Large Portion (n=84)	22.2262 (1.94158)	2.6646 (0.10779)	30.8810 (0.67417)
	Total (n=170)	21.5294 (1.25100)	2.6350 (0.07102)	30.5000 (0.45380)

The standard errors are in parentheses. There were no significant differences in personal characteristics across conditions.

4.3.3 Hypothesis Testing (Eating Alone Condition)

Portion size is widely recognised as having a profound impact on the amount of food that people consume (e.g. Zlatevska *et al.*, 2014). However, from the data collected in this research, the portion size effect is not significant in Study 1 (i.e. Hypothesis *H1* is not supported). In order to examine if it was the effect of social eating that has eliminated the effect of portion size, the data analysis of the Study 1 was repeated excluding the data of individuals eating in a social setting (shown in Table 11 below).

Table 11 Parameter Estimates (Study 1 - Alone Eating Condition)

	Parameter	B	t	Sig.	Observed Power ^b
	Intercept	159.118	4.353	0.000	0.988
	Self-Esteem	-117.329	-2.981	0.006	0.821
	Restraint	-38.551	-3.275	0.003	0.886
<i>H1</i>	Portion Size: Small	-139.171	-3.321	0.002	0.894
<i>H2</i>	Social Setting: Alone	N/A	N/A	N/A	N/A
<i>H3</i>	(Portion Size: Small) * (Social Setting: Alone)	N/A	N/A	N/A	N/A
<i>H4a</i>	(Portion Size: Small) * (Self-Esteem: Low)	134.759	2.704	0.011	0.743
<i>H4b</i>	(Portion Size: Small) * Restraint	38.312	2.619	0.014	0.716
<i>H4c</i>	(Social Setting: Alone) * (Self-Esteem: Low)	N/A	N/A	N/A	N/A
<i>H4d</i>	(Social Setting: Alone) * Restraint	N/A	N/A	N/A	N/A
	(Portion Size: Small) * (Self-Esteem: Low) * Restraint	-39.301	-2.231	0.034	0.578
	(Self-Esteem: Low) * Restraint	34.418	2.641	0.013	0.723

As shown in Table 11 above, when the data on the consumption amount of individuals eating in a social setting are excluded from the analysis, the portion size effect becomes significant. Therefore, the current study concludes that the social effect has eliminated the effects of portion size that have been consistently reported as robust in different studies (e.g. Zlatevska *et al.*, 2014; Hermans *et al.*, 2012)

4.4 Discussion – Study 1

The hypothesis testing results of Study 1 are summarised in Table 12 below. Due to the research design, the portion size effect was not observed in Study 1, where hypothesis *H1* was not supported. However, it was concluded that the effect of portion size was masked by the effect of the social setting. This was demonstrated through the evidence obtained by removing the data collected from participants eating in a social setting from the GLM analysis in Section 4.3.3. The portion size effect was observed in the current study when participants eating in a social setting were removed from the GLM analysis, as summarised in Table 11 in Section 4.3.3. Congruent with the extant literature, the positive B-value of the portion size in the parameter estimates of the current study shows that participants consume less when eating from a small portion. Therefore, the visibility of the snack was reduced in Study 2 to mitigate the social modelling effects so that the relationship between the effects of portion size and social setting can be further investigated.

Table 12: Hypothesis Testings - Study 1

	Hypothesis	Study 1
H1	Increasing the portion size will result in an increase in the amount consumed.	Eating alone: Supported
		Social eating: Not supported
H2	Eating in the presence of other individual(s) will cause a change in the amount consumed when compared to eating alone.	Supported
H3	The portion size effect will be moderated by the presence of other individuals in an eating event.	Supported
H4a	Self-esteem will moderate the portion size effect.	Not supported
H4b	Restraint will moderate the portion size effect.	Not supported
H4c	Self-esteem will moderate the social effect.	Not supported
H4d	Restraint will moderate the social effect.	Supported
H5	The amounts eaten by individuals in a social setting will be correlated.	Supported

In line with the studies in the extant literature (see Herman et al., 2003), the current study observed the effect of the social setting on food consumption. However, the extant literature of social effect shows that eating in a social setting may both increase and decrease the amount consumed by consumers. As outlined Chapter 1.0, Herman et al. (2003) categorise the literature concerning the social effect into three areas: social facilitation, social modelling and impression management. Under certain circumstances, different types of social effect can be expected, as summarised in Figure 1. With all known contextual cues summarised in Figure 1 being controlled in order to examine the effect eating in a social setting, the B-value of social effect in the current study found that consumers tend to reduce their consumption when they are eating in a social setting. This finding is consistent with Vartanian et al.'s (2015) meta-analysis assessment of 38

social modelling empirical researchers, where the social facilitation effect was found to be stronger than the social suppression effect when individuals are eating in the presence of a confederate.

Based on the empirical evidence of this study, the effect of the social setting was found to be profound and it moderated the robust effect of the portion size. This finding signifies that consumers respond differently to an increase in portion size when they are eating in different social settings (eating alone or eating in the presence of other individuals). While the amount eaten by an eating partner may not moderate the effect of portion size (Hermans et al., 2012), the current research shows that individuals respond differently to portion size while they are eating alone compared to eating socially. This finding would therefore make a large contribution towards the existing knowledge gap in reducing the negative effects of portion size. Large portion size, which is widely known to increase the amount consumed (Zlatevska *et al.* 2014), is one of the leading cause of obesity (Levitsky & Pacanowski, 2011) and has adverse effects on consumers' general well-being (Ogden, Carroll, Kit, & Flegal, 2012). However, portion sizes are unlikely to become smaller due to their monetary benefit for both organisations and consumers. Furthermore, research has shown that neither educating consumers about the adverse effects of large portion sizes nor practising mindful eating is effective in reducing the effect of portion size (e.g. Cavanagh et al., 2014; Marchiori & Papies, 2014). The current findings contribute to closing the extant knowledge gap of the literature concerning how to reduce the adverse effect of portion sizes.

The portion size effect was not found to be moderated by self-esteem or restraint in this study. Due to the portion size effect being masked by the social setting, no interaction effect was found between portion size and self-esteem or portion size and restraint. When data obtained from participants eating in a social setting were removed from the analysis in Section 4.3.3, the portion

size effect interacted with self-esteem and restraint. Therefore, how much consumers increase their consumption due to having a larger portion also depends on certain personal contextual cues like their self-esteem level and restraint in consumption. This finding adds to the knowledge gap in reducing the adverse effect of portion size. However, the social setting was shown to be only moderated by restraint, not by self-esteem. Although it is unclear as to why the effect of social setting differs in different restraint levels but not in different self-esteem levels, the low observed power of self-esteem could be an explanation for this phenomenon.

Social modelling was observed in this study where the amount consumed by participants was shown to be correlated. Despite the finding that individuals have a tendency to reduce their consumption when they are eating in a social setting, it is discovered in this study that consumers do observe the amount their eating partners consume and adjust their consumption accordingly. Herman *et al.* (2003) propose inhibitory norms to explain the social facilitation in which consumers avoid consuming excessively. However, Herman *et al.* suggest that consumers may be caught up in a loop of consuming an extra mouthful of food as “allowed” by their eating partner taking an extra mouthful. This explanation matches entirely with the notion that the mere presence of food induces consumption (e.g. Boon, Stroebe, Schut, & Jansen, 1998; Bossert-Zaudig, Laessle, Meiller, Ellgring, & Pirke, 1991). The current research suggests that the same explanation can be applied to the findings in the current study where social modelling and social suppression (i.e. impression management) are observed. This may seem paradoxical; however, eating duration is the key to this paradox. Social facilitation was predominantly reported in dietary diary studies conducted by John de Castro and the eating durations in de Castro’s studies were not fixed and therefore varied. It is the extended duration of eating that extended the participants’ exposure to food and therefore elevated their consumption, which also led to the proposal of the time-extension hypothesis as the mechanism of social facilitation by de Castro (1994). With eating duration controlled in the current study, even though participants were caught

up in the “extra mouthful” loop encouraged by their eating partners’ consumption, the eating duration was unlikely to be long enough to cause social facilitation. Thus, reduced intake (i.e. impression management) was observed among participants in this study along with social modelling.

Study 1, which revealed a number of interesting findings, was then repeated with a lower social visibility by replacing the Arnott’s Nice biscuits with M&M’s chocolates in Study 2. The main purpose of Study 2 is to examine the effect of social visibility on the main research questions of the current research outlined in Section 1.2 and summarised below.

Research Question 1: Will consumers respond differently to an increase in portion size in the presence of others as compared to when they are alone?

Research Question 2: Does social visibility have an impact on the relationship between the effect of portion size and social setting?

Research Question 3: Will individuals consume more or less when eating with other individuals given the known context effects being controlled?

Research Question 4: Will the amounts consumed by individuals correlate to the amounts consumed by other individuals in the same eating event?

Research Question 5: Will personal characteristics influence the effect of portion size and social setting?

Research Question 5a: Will the influence of portion size be affected by individuals’ restrained eating levels?

Research Question 5b: Will the influence of social setting be affected by individuals’ restrained eating levels?

Research Question 5c: Will the influence of portion size be affected by individuals’ self-esteem levels?

Research Question 5d: Will the influence of social setting be affected by individuals' self-esteem levels?

Based on the statistical interaction found between the effects of portion size and social setting in Study 1, we can conclude that both variables are interdependent. By reducing the social visibility level, Study 2 aims to examine:

- (i) if social modelling is operationalised by social visibility and
- (ii) if social modelling and portion size effect are interdependent when the social visibility is low.

The findings in Study 2 examined the antecedent of social modelling and possible ways to reduce the negative effects of portion size. The following chapter discusses Study 2 in detail.

5.0 STUDY 2 – LOW SOCIAL VISIBILITY CONDITION

5.1 Research Objectives

The main objective of Study 2 was to examine the effect of social visibility on the combined effect of portion size and social setting. In the extant literature, social effects have always been attributed to social norms (e.g. Herman & Polivy, 2005; Herman et al., 2003; Hermans, 2013; Roth et al., 2001). The social norms mentioned here refers to the perceived appropriate consumption amount set by the other individuals in an eating event. However, the extent of social norm exposure for every individual differs and depends largely on social visibility. Therefore, the social effect is expected to be dependent on social visibility. Study 2 examines if social visibility alters the relationship between social setting and portion size.

In addition to this, Study 2 also examines whether social visibility has an effect on social modelling, the direction of the social effect, other contextual cues and the relationship between social setting and these contextual cues. Study 1 was repeated in Study 2; however, a different food type that generates a lower level of social visibility was used in order to examine if social visibility affects the findings of Study 1.

5.2 Research Methodology – Study 2

5.2.1 Research Procedure

The research procedure of Study 2 is identical to the research procedure of Study 1. The only difference between these two studies was the type of food being used. The Arnott's Nice biscuits that were used in Study 1 were replaced with M&M's chocolates in Study 2. M&M's chocolates, which are much smaller in per unit size than Arnott's Nice biscuits, were used in Study 2 to generate a lower level of social visibility. Figure 6 below lists the stages of the research procedure in Study 2.

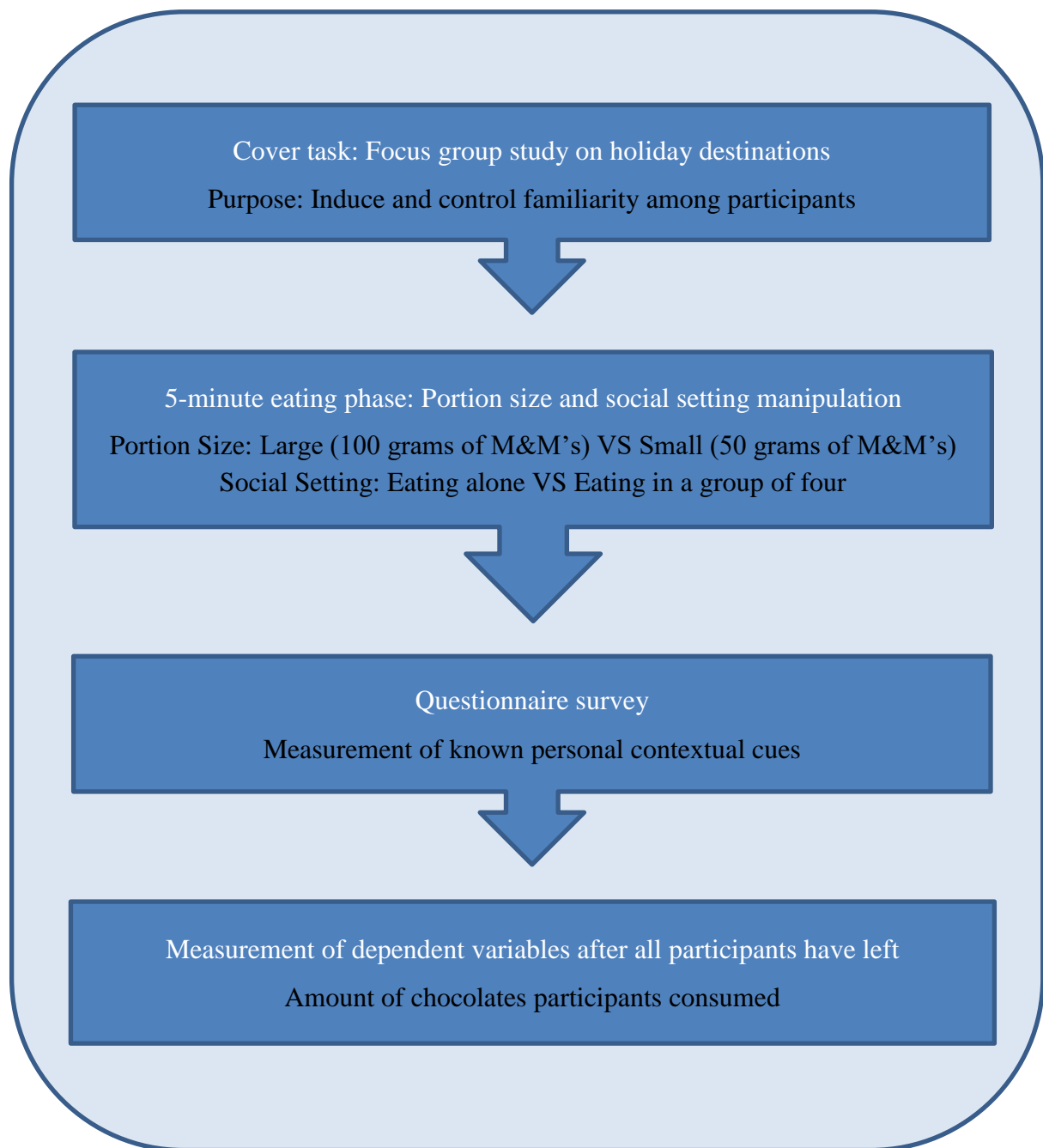


Figure 6: Procedure for Study 2

This study was conducted over five months from June 2014 to October 2014 during weekdays between 10am and 6pm. There were 232 participants in this study and they were all Bond University students. Among the 232 participants, 107 were male and 125 were female; 194 were undergraduate students and 38 were postgraduate students. In order to disguise the true intention of the study, the same cover story was used as in Study 1: participants were invited to take part

in an unrelated survey on holiday destinations and were given incidental access to food. Participants did not know that the study was a study of food consumption behaviour, therefore the possibility of participants behaving unnaturally because of the knowledge of their consumption amount being recorded was eliminated. All studies described and reported in the current research were approved by the Bond University Research Ethics Committee (BUHREC). The ethical considerations of the current research were addressed in accordance with Bond University's policy on ethical research as specified in the National Statement on Ethical Conduct in Research Involving Humans by the Australian Government.

For the cover story, participants were told that the current study is a study investigating factors that influence consumers' behaviour on their choice of holiday destination. Every participant signed up for the experiment on a voluntary basis and was awarded 1% course credit for completing this study. In order to sign up for this study, participants had to log on to a website (<https://bonduniversity.sona-systems.com>). For the purpose of sending reminder messages to participants and keeping a record of their participation in order to award them with course credit, participants had to register for an account in the website providing their details. There were many experimental sessions available listed on the website. Upon successful registration, participants were allowed to pick an experimental session from the list of different available experimental session times. The registration system prevented participants from signing up more than one session; therefore, each participant could only attend one session.

In order to avoid the possibility of introducing extraneous variables, every session had four participants regardless of its experimental condition. Any experimental session that had fewer than four participants sign up was cancelled and participants were notified via email and short text message in advance. All sessions that were conducted with fewer than four participants, for example cases where participants did not show up to the experimental session, were excluded

from the analysis. By doing this, the current study eliminated the possibility of explaining the variation of consumption amount with the number of participants in the experimental sessions.

As soon as participants arrived at the experimental study venue, they were asked to switch their mobile phones into silent mode and place them in a storage area together with all their other belongings. Participants were asked to sit at a round table while waiting for other participants to arrive. The storage area was located next to the round table; as shown in Appendix E, the storage area was covered with a large cloth when all participants had arrived and stored their belongings in it. Doing this prevents participants from using their mobile phones and electronic devices or accessing any personal belongings. This is crucial as they may act as extraneous variables of the experiment and cause inaccuracy in the collected data.

Each participant was given a randomly allocated seat at the round table with their name tags in place; the setting of the round table is shown in Appendix F. Once all four participants had arrived, the researcher conducted the experimental session following the script attached in Appendix G. It was explained to the participants that the experimental session would begin with a group discussion. Participants were also told that the researcher would not be part of the group discussion and would only stand near the group taking notes from their discussions. After the researcher introduced himself to the group of participants, participants were asked to introduce themselves to the other group members. The researcher then gave them the first topic to be discussed among themselves, entitled “The Most Wanted Holiday Destination.” Participants were then asked to work in a group and list the Seven Wonders of the World. Following the first group activity, participants were asked to have a discussion and come up with a consensus in the group of the five best holiday destinations within Australia in descending order. With the group effort, participants were then asked to list 10 countries in Asia and 10 countries in Europe. Lastly, participants were asked to share their most enjoyable holiday experience with other group

members. These group discussions and activities ensured the involvement of every participant and prompted many interactions between participants. These group discussions and group activities, which were used as a cover task to disguise the genuine research and induce familiarity among participants, lasted 15 minutes in every experimental session.

After the 15-minute group discussions and activities, participants were moved to the next stage of the experiment: the eating phase. Depending on the experimental condition (social eating or eating alone), participants were either sitting together at a round table adjacent to the one at which they performed the cover task or sitting in separate cubicles. In both experimental conditions, each participant was served a clear plastic container of chocolates with the lid opened for the participants by the researcher (refer Appendix B). The chocolates served to the participants were M&M's chocolates and are shown in Appendix B. Each container was weighed before and after the experiment using a Salter 1066 electronic kitchen scale. In large portion size condition, 100 grams of chocolates were served; in small portion condition, 50 grams of chocolates were served. [All participants in one session get the same portion.](#) The containers of chocolates were not prepared and set up in the beginning of the experimental session; they were kept away from participants' vision in a storage bag behind a table in order to avoid unwanted trigger of hunger resulting from the sight and smell of the chocolates. The researcher alone began to set up the containers of chocolates on the round table adjacent to the one at which participants performed the cover task.

The eating session immediately followed the completion of the related tasks of the cover story. For each eating session, participants were given either a large portion or small portion. The social settings were also manipulated, with participants either eating alone or eating in a group. Participants were randomly assigned to one of the following four conditions resulting from the two (portion size: small, large) by two (social setting: alone eating, social eating) between-subject

design, as shown in Table 2 above. During the eating phase, the researcher left the room on the pretext of preparing for the next part of the research session so that the participants would not feel that they were being observed while eating. Participants were told that the chocolates were given to them as a thank you for taking part in this experiment and they could have as many as they like. For the social eating condition, participants were told that they could interact and converse with the other participants who were sitting together with them at the round table while enjoying the chocolates provided to them. For the eating alone condition, participants were asked to remain at the cubicle and not interact or converse with the other participants, who were separated into different cubicles. They were also reminded not to use the computer stationed in the cubicles until instructed. Participants in the eating alone condition were also told that there was a poster of the Seven Wonders of the World in each cubicle (as shown in Appendix H) that they could read. In order to ensure participants in the eating alone condition ate in isolation, signs of “Please remain silent” (as attached in Appendix I) were pasted on the wall of each cubicle.

For all experimental conditions, the researcher returned to the room after five minutes and asked participants to answer a questionnaire using the computers stationed in each cubicle. Participants, who were still unaware of the genuine research purpose of the current study, were asked to complete a questionnaire that continued the cover story of the holiday destination theme but also included questions about the chocolates provided. The questionnaire included manipulation checks on the serving sizes and all known personal contextual cues that could possibly be the moderators of the main effects. The details of personal contextual cues measured are outlined in Section 4.2.2 below and an actual version of the questionnaire is also attached in Appendix K.

The computers that were prepared for questionnaire survey in each cubicle were all put into screensaver mode displaying the message “Please do not use the computer until instructed.”

Participants in the social eating condition stood up and moved to the cubicles at the corners of

the room and began to answer the questionnaire. Participants in the eating alone experimental condition moved to the table next to the one they sat on within the same cubicle and began the questionnaire. At this point, all the containers of chocolates were collected and weighed out of sight of the participants. The questionnaire was the last part of the experimental study; as soon as a participant completed the questionnaire, the participant was reminded to collect their belongings before leaving the venue.

5.2.2 Measures of Personal Contextual Cues

Using experimental design, all known food contextual cues were controlled and the portion size was manipulated. Similarly, all known consumption contextual cues were controlled by the experimental design while the social setting was manipulated. Since participants' personal contextual cues cannot be controlled or manipulated, they were measured to make sure that the contextual effects were due to the manipulated independent variables and not caused by personal contextual cues. Below are the scales that were used to measure participants' personal contextual cues. These scales were chosen based on some of the most prominent papers in the literature of food consumption.

5.2.2.1 Mood

Mood was shown to influence consumers' consumption amount (Patel & Schlundt, 2001). The Positive and Negative Affect Scale (PANAS: Watson *et al.*, 1988) was used to measure participants' mood. Cronbach's alpha was 0.820.

5.2.2.2 Desire for Status

Participants' desire for status was measured using the Need for Status scale. (Dubois *et al.*, 2012). Cronbach's alpha was 0.879.

5.2.2.3 Self-Esteem

Participants' self-esteem level was measured using Rosenberg's Self-Esteem Scale (Rosenberg, 1965). Cronbach's alpha was 0.880.

5.2.2.4 Restrained Eating

The restrained eating subscale of the Dutch Eating Behaviour Questionnaire (DEBQ-R) (van Strien *et al.*, 1986) was used to measure if participants have restrained patterns in their consumption. Cronbach's alpha was 0.912.

5.2.2.5 Impulsivity

The impulsivity of participants were measured using the motor impulsiveness subscale of the Barratt Impulsiveness Scale (Patton *et al.*, 1995) that examines how much a person is "acting on the spur of the moment." The scale consists of seven items rated on a four-point scale of intensity. Cronbach's alpha was 0.693.

5.2.2.6 BMI, Hunger and Liking of Food

The participants' body mass index (BMI) was calculated based on participants' self-reported height and weight by dividing their weight in kilograms (kg) by their height in metres squared (m^2). Participants' hunger level before and after the experimental session and how much they liked the chocolates were measured using a 100-point scale of intensity.

5.2.2.7 Rapport

The group rapport level among participants was measured using an eight-point Likert scale asking participants to indicate the rapport level among all members in the group. Due to the vagueness of the concept of rapport, a definition of the term adapted from Grahe and Bernieri (2002) was given to participants prior to the question.

5.2.2.8 Comfort

Participants' comfort level during the social interactions in a group of four people was measured using the measure of comfort scale (Frable *et al.*, 1990). Cronbach's alpha was 0.612.

5.3 Results – Study 2

As outlined in Section 3.2, the number of participants was kept consistent at four across every experiment session in order to avoid the possibility of a dependent variable being explained by variation in the participation number. Thus, among the 62 experimental sessions that were conducted, a total of 20 sessions that have fewer than four participants due to their absence or late arrival were excluded from the analysis. As a result, 64 participants among the original 232 participants in Study 2 of the current research were removed from the analysis. Before the hypothesis testing, manipulation checks were first conducted to confirm that the experimental conditions were not characterised by other contextual cues. This was done to ensure that the variations of the dependent variables were only explained by the independent variables but not some of the other contextual cues. SPSS version 23 statistical analysis software was used as the statistical analysis tool.

In order to show that the main effects are explained by the manipulated variables instead of other potential sources like participants' self-esteem or restraint level, mean comparison tests were carried out. Mean comparison tests were conducted to check that the mean values of these contextual cues are not significantly different across experimental conditions in order to make sure the experimental conditions were not the result of these alternate variables. The ANOVA tests summarised in Table 13 below shows that the mean value for participants' self-esteem level is not significantly different across different experimental conditions in Study 2. Participants

eating in a group and eating alone had similar self-esteem level ($\text{Mean}_{\text{Eating in a group}} = 31.4384$; $\text{SD} = 5.04421$; $\text{Mean}_{\text{Eating alone}} = 29.7838$; $\text{SD} = 5.55845$; ANOVA's test $F(1,108) = 2.466$, $p = 0.119$). The mean values for participants' self-esteem were consistent across those two other experimental conditions of different portion sizes ($\text{Mean}_{\text{Large portion}} = 30.2075$; $\text{SD} = 5.67504$; $\text{Mean}_{\text{Small portion}} = 31.5088$; $\text{SD} = 4.80001$; ANOVA's test $F(1,108) = 1.694$, $p = 0.196$). Therefore, the experimental conditions are not characterised by participants' self-esteem level.

Table 13: Mean value of participants' self-esteem across different experimental conditions (Study 2)

Experimental Condition	N	Mean	Std Dev	Comparison p-value
Eating Alone	37	29.7838	5.55845	0.119
Eating in a Group	73	31.4384	5.04421	
Small Portion	57	31.5088	4.80001	0.196
Large Portion	53	30.2075	5.67504	

As summarised in Table 13, the ANOVA test showed that the mean value for participants' restrained eating levels were not significantly different across the different experimental conditions in Study 2. Participants who were assigned to the experimental condition where they ate in a group had the same mean value of restrained eating level as the participants who were assigned to the experimental condition where they ate alone ($\text{Mean}_{\text{Eating in a group}} = 2.4569$; $\text{SD} = 0.89105$; $\text{Mean}_{\text{Eating alone}} = 2.5946$; $\text{SD} = 0.97921$; ANOVA's test $F(1,108) = 0.548$, $p = 0.461$). The mean value for participants' restrained eating level was also consistent across the experimental conditions of different portion sizes ($\text{Mean}_{\text{Large portion}} = 2.5214$; $\text{SD} = 0.89469$; $\text{Mean}_{\text{Small portion}} = 2.4864$; $\text{SD} = 0.94955$; ANOVA's test $F(1,108) = 0.040$, $p = 0.843$). Therefore, the experimental conditions are not characterised by participants' restrained eating levels.

Table 14: Mean value of participants' restraint across different experimental conditions (Study 2)

Experimental Condition	N	Mean	Std Dev	Comparison p-value
Eating Alone	37	2.5946	0.97921	0.461
Eating in a Group	73	2.4569	0.89105	
Small Portion	57	2.4864	0.94955	0.843
Large Portion	53	2.5214	0.89469	

From the one-way ANOVA tests shown above, participants' personal characteristics were not statistically different across all four different experimental conditions. Therefore, the current study concludes that the measured variation of consumption amount was due to the independent variables but was not due to participants' personal contextual cues. After making sure that the experimental conditions were not characterised by participants' self-esteem and restraint, hypothesis testings were conducted. A discussion of the main findings is outlined in Section 5.4.

The manipulation of portion size was checked by comparing participants' perceptions of the size of food being served to them across large and small portion conditions. At the end of the experimental session, participants were asked to complete a questionnaire survey (Appendix J) consisting of numerous other contextual effects. Participants were asked to rate on a scale from 0 to 100 the size of the complimentary snack food. From the ANOVA test summarised below, it shows that participants in small portion condition perceived the size of the complimentary snack food (M&M's chocolates) to be smaller than the participants in the large portion condition. The manipulation of portion size was successful ($\text{Mean}_{\text{Large portion}} = 70.1887$; $\text{SD} = 25.46571$; $\text{Mean}_{\text{Small portion}} = 54.1754$; $\text{SD} = 22.48898$; ANOVA's test $F(1,108) = 12.259$, $p = 0.001$).

Table 15: Mean value of participants' perceived size of complimentary snack food being served to them across different experimental conditions (Study 2)

Experimental Condition	N	Mean	Std Dev	Comparison p-value
Small Portion	57	54.1754	22.48898	0.001
Large Portion	53	70.1887	25.46571	

5.3.1 Summary of Research Hypotheses

Based on the research objectives and the identified research gaps, five research questions were developed and are outlined in Section 1.2. Six research hypotheses were derived from the literature review to fill in the existing knowledge gaps and they are summarised in this section. In order to close the research gaps identified in this research, the hypotheses were tested and presented in the following section, Section 5.3.2.

From the literature review, the following hypotheses were developed. The research hypotheses of Study 2 are similar to the ones in Study 1. As mentioned in the research objectives of Study 2 described in Section 5.1, the main aim of Study 2 was to examine the effect of social visibility on the contextual cues under study in the current research. Therefore, every hypothesis in Study 1 was repeated in Study 2 to test for the effect of social visibility.

H1: Increasing the portion size will result in an increase in the amount consumed.

H2: Eating in the presence of other individual(s) will cause a change in the amount consumed when compared to eating alone.

- H3:* The portion size effect will be moderated by the presence of other individuals in an eating event.
- H4:* Personal characteristics will moderate the portion size and social effects.
- H4a:* Self-esteem will moderate the portion size effect.
- H4b:* Restraint will moderate the portion size effect.
- H4c:* Self-esteem will moderate the social effect.
- H4d:* Restraint will moderate the social effect.
- H5:* The amounts eaten by individuals in a social setting will be correlated.
- H6:* The relationship between portion size and social setting will be influenced by the level of social visibility.

Research hypotheses *H1* to *H5* in Study 2 are the same as the ones in Study 1 that were outlined in Section 4.3.1. Hypothesis *H6* was derived to test for the effect of social visibility on the relationship between the effects of portion size and social setting. The current study is interested in studying how social setting and portion size jointly affect the amount of food consumers would eat. Social effects have always been explained by consumers' consumption being influenced by social norms (e.g. Herman *et al.*, 2003). Through a series of three experiments that use remote confederate and live confederate, Vartanian *et al.* (2013) showed that social modelling effect appear to be operationalised by the norm of appropriateness. However, social visibility plays a role in the extent of social norms that consumers are being exposed to (Friedkin, 2006). Based on this proposition, the social effect will be influenced by social visibility. Therefore, the relationship between portion size and social effect was hypothesised to be influenced by social visibility.

5.3.2 Hypothesis Testing

Hypotheses *H1* and *H2* were tested by examining whether there is a main effect of social setting and portion size. Hypothesis *H3* was tested by examining if there is an interaction between the two independent variables. Hypothesis *H4* was tested by examining if restraint and self-esteem interact with independent variables. Hypothesis *H5* was tested by examining if the amounts consumed by participants in an experimental session are correlated. Hypothesis *H6* was tested by comparing the correlation coefficients of participants' consumption amount across Study 1 and Study 2.

Hypotheses *H1*, *H2*, *H3* and *H4* were tested using a GLM test and the dependant variable, the amount consumed by participants, was included as *Dependant Variable* in the model. The independent variables, social setting and portion size, were included as *Fixed Factors(s)* in the model. Participants' self-esteem score, which ranges from 10 to 40, was divided into three groups (10-28, 29-31 and 32-40) and was also included into the model as *Fixed Factors(s)* for spotlight analysis. Although participants' self-esteem was not manipulated in the current research, self-esteem was treated as an independent variable in the model. Participants' restrained eating level, on the other hand, was included as *Covariate(s)*. It is important to note that variables that were included as *Covariate(s)* *General Linear Model* do not meet the common meaning of covariate, which generally refers to variables that are of no interest in the study but need to be controlled. Instead, these variables are of the most interest to the study, just like the independent variables. Although there are many other variables that this research has measured (i.e. mood, desire for status, impulsivity, weight, hunger, liking of food, rapport and comfort), they were not included in the *Covariate* slot of *General Linear Model*. This is due to the fact that the current study aimed to investigate if participants' restrained eating level moderates the main effect. Consequently, the model of the analysis is shown below:

$$\begin{aligned} \text{Consumption Amount} = & \text{Social Setting} + \text{Portion Size} + \text{Self-Esteem} + \text{Restrained Eating} + \\ & (\text{Portion Size} * \text{Restrained Eating}) + (\text{Self-Esteem} * \text{Restrained Eating}) + (\text{Social Setting} * \\ & \text{Restrained Eating}) + (\text{Portion Size} * \text{Self-Esteem}) + (\text{Social Setting} * \text{Portion Size}) + (\text{Social} \\ & \text{Setting} * \text{Self-Esteem}) + (\text{Portion Size} * \text{Self-Esteem} * \text{Restrained Eating}) + (\text{Social Eating} * \\ & \text{Portion Size} * \text{Restrained Eating}) + (\text{Social Setting} * \text{Self-Esteem} * \text{Restrained Eating}) + (\text{Social} \\ & \text{Setting} * \text{Portion Size} * \text{Self-Esteem}) \end{aligned}$$

Due to the uneven distribution of participants' self-esteem level in the current study, spotlight analysis was used in the analysis to avoid error in analysis. The data were equally divided into three groups based on participants' self-esteem levels; in order to tease out the effect of self-esteem, only the extreme ends of the data groups which have either high or low level of self-esteem were included in the analysis. The parameter estimates obtained from the GLM analysis are presented in Table 16 below.

Table 16 Parameter Estimates Study 2

	Parameter	B	t	Sig.	Observed Power ^b
	Intercept	59.433	5.085	0.000	0.999
	Self-Esteem: Low	-51.410	-3.234	0.002	0.893
	Restraint	-14.693	-2.956	0.004	0.833
<i>H1</i>	Portion Size: Small	-47.339	-3.213	0.002	0.889
<i>H2</i>	Social Setting: Alone	47.760	2.485	0.015	0.691
<i>H3</i>	(Portion Size: Small) * (Social Setting: Alone)	0.656	0.035	0.972	0.050
<i>H4a</i>	(Portion Size: Small) * (Self-Esteem: Low)	61.503	3.058	0.003	0.857
<i>H4b</i>	(Portion Size: Small) * Restraint	16.788	2.732	0.007	0.772
<i>H4c</i>	(Social Setting: Alone) * (Self-Esteem: Low)	-48.762	-2.415	0.018	0.666
<i>H4d</i>	(Social Setting: Alone) * Restraint	-17.857	-1.967	0.052	0.495
	(Self-Esteem: Low) * Restraint	17.324	2.858	0.005	0.808
	(Portion Size: Small) * (Self-Esteem: Low) * Restraint	-22.235	-2.880	0.005	0.814
	(Social Setting: Alone) * (Portion Size: Small) * Restraint	-0.505	-0.064	0.949	0.050
	(Social Setting: Alone) * (Self-Esteem: Low) * Restraint	20.186	2.437	0.017	0.675
	(Social Setting: Alone) * (Portion Size: Small) * (Self-Esteem: Low)	-8.812	-0.592	0.555	0.090

Based on the parameter estimates presented in Table 16 above, hypothesis *H1* is supported. Therefore, the manipulation of portion size was shown to be successful. In addition to this, the results also showed that individuals' consumption were affected by both of the social settings (alone eating versus social eating). This was shown by hypothesis *H2* being supported in the GLM analysis. Hence, the manipulation of social setting also proved successful. However, the effect of portion size has no interaction with the social effect, with hypothesis *H3* not being supported. In other words, the influence of the portion size (small portion versus large portion) on the total consumption amount of an individual does not depend on the social setting (alone eating versus social eating) of an eating event. Hypotheses *H4a*, *H4b*, *H4c* and *H4d* are also supported; therefore, both restraint and self-esteem are shown to moderate the effects of social setting and portion size.

For individuals with a low self-esteem, the more restrained they are, the more they consume. Although the results do not show that if this is true when individuals are eating in a social setting, this is true when individuals are eating alone. However, when the portion size is small, the more restrained low self-esteem individuals consumed less compared to a less restrained consumer.

In order to examine if the amount consumed by individuals eating in a social setting is correlated, hypothesis *H5* was tested by conducting correlation tests on the amounts consumed by participants. Every participant was labelled by the seat number to which they were randomly allocated. Participants who sat at seat number 1 are labelled as Participants_1 and the same applies to all other participants. Participants that sat at seat number 2, 3 and 4 are labelled as Participants_2, Participants_3 and Participants_4 respectively. From the correlation results

shown in Table 17 below, the consumption amounts among all participants in one experimental session were not correlated. We conclude that these results are due to the low social visibility.

Table 17: Correlation Tests - Study 2

		Participants_1	Participants_2	Participants_3	Participants_4
Participants_1	Pearson Correlation	1	0.260	-0.303	-0.010
	Sig. (2-tailed)		0.181	0.117	0.961
	N	28	28	28	28
Participants_2	Pearson Correlation	0.260	1	0.010	0.279
	Sig. (2-tailed)	0.181		0.959	0.151
	N	28	28	28	28
Participants_3	Pearson Correlation	-0.303	0.010	1	0.191
	Sig. (2-tailed)	0.117	0.959		0.330
	N	28	28	28	28
Participants_4	Pearson Correlation	-0.010	0.279	0.191	1
	Sig. (2-tailed)	0.961	0.151	0.330	
	N	28	28	28	28

Although social modelling is shown with M&M'S chocolates (which are used to simulate low social visibility in this study; Robinson et al., 2011; Vartanian et al., 2013) and distractions such as watching television (Herman et al., 2005) and cover task during eating phase (Vartanian et al., 2013), there were no competing norms in their studies. In other words, participants in Robinson et al.'s (2011), Vartanian et al.'s (2013) and Herman et al.'s (2005) studies conformed to social cues even though the social visibility was low due. This is possibly due to the absence of competing norm. The use of the M&Ms in Study 2 instead of the cookies in Study 1 eliminates the social modelling and reintroduces the portion size effect as expected if no social modelling is taking place. Based on the notion that individuals seek for certain norm of appropriateness in all eating events, we posit that portion size effect prevails and that social modelling can be

expected in the absence of competing norms when the social visibility is low. This demonstrates that social modelling is possibly the moderator of portion size effect and that social visibility qualifies this moderation effect. The fact that social modelling was found using the same food type (M&M'S chocolates), although it remains possible, we cannot conclude that social modelling is qualified by social visibility.

The mean values of participants' consumption amount, restraint and self-esteem across all four experimental conditions are summarised in Table 18 below. In Table 18, it is shown that the portion size effect is larger when individuals are eating alone compared to when individuals are eating in a group. Participants' restraint and self-esteem levels are consistent across all experimental conditions.

Table 18: Mean Comparisons - Study 2

Social Setting	Portion Size	Consumption (g)	DEBQ-R	Self-Esteem
Alone Eating	Small Portion (n = 20)	16.2500 (3.09828)	2.7400 (0.233553)	30.4000 (1.157129)
	Large Portion (n = 17)	27.7647 (6.747836)	2.4235 (0.217528)	29.0588 (1.46897)
	Total (n = 37)	21.5405 (3.598797)	2.5946 (0.160981)	29.7838 (0.913804)
Social Eating	Small Portion (n = 37)	16.2432 (2.162818)	2.3492 (0.144421)	32.1081 (0.747151)
	Large Portion (n = 36)	20.8333 (2.871177)	2.5676 (0.150433)	30.7500 (0.914933)
	Total (n = 73)	18.5068 (1.798562)	2.4569 (0.10429)	31.4384 (0.59038)

The standard errors are in parentheses. There were no significant differences in personal characteristics across conditions

The current research shows that the consumption amount among participants in one experimental session is correlated in Study 1 but not in Study 2. This shows that the effect of social modelling is found among participants when the level of social visibility is high. Therefore, the relationship between portion size and social setting is influenced by the level of social visibility. Thus, hypothesis *H6* is supported.

5.4 Discussion – Study 2

As summarised in the table below, hypothesis *H1* is supported in this study. Consistent with the literature, participants in this study consumed more from larger portion sizes. The social effect was also observed in this study, as participants' consumption amounts were affected by the social setting. Compared to participants who were eating alone, participants reduced their consumption when they are eating in the presence of other individuals. This finding is supported by the meta-analysis assessment conducted by Vartanian *et al.* (2015), where the effect of social suppression was found to be greater than the effect of social facilitation in social modelling studies.

Table 19 Hypothesis Testings - Study 2

	Hypothesis	Study 2
<i>H1</i>	Increasing the portion size will result in an increase in the amount consumed.	Supported
<i>H2</i>	Eating in the presence of other individual(s) will cause a change in the amount consumed compared to when eating alone.	Supported
<i>H3</i>	The portion size effect will be moderated by the presence of other individuals in an eating event.	Not supported
<i>H4a</i>	Self-esteem will moderate the portion size effect.	Supported
<i>H4b</i>	Restraint will moderate the portion size effect.	Supported
<i>H4c</i>	Self-esteem will moderate the social effect.	Supported

<i>H4d</i>	Restraint will moderate the social effect.	Supported
<i>H5</i>	The amounts eaten by individuals in a social setting will be correlated.	Not supported
<i>H6</i>	The relationship between portion size and social setting will be influenced by the level of social visibility.	Supported

Unlike Study 1, no interaction between portion size and social setting was found in Study 2. Hence, the portion size effect was not moderated by the social effect in Study 2. This is due to the manipulation of social visibility where smaller size of food (M&M's chocolates) were used in Study 2 to generate a lower social visibility condition. With lower social visibility, the social norms set by eating partners became less influential as the amount they consume is harder to trace. Therefore, the social effect becomes weaker and, in Study 2, is not strong enough to moderate the effect of portion size.

Personal contextual cues including self-esteem and restraint were found to moderate the effect of portion size and social setting. Unlike Study 1, the effects of self-esteem and restraint on the amount participants consume were found to be strong in Study 2, with the observed power of 0.893 and 0.833 respectively. This is due to the lower level of social visibility in Study 2, as when the social norms set by eating partners are unclear, participants responded more to portion size and personal contextual cues. Therefore, portion size interacted with self-esteem in Study 2 but not in Study 1. Based on these findings, the current research concludes that the effect of portion size is dependent on consumers' self-esteem and restraint levels only when the social visibility is low. The findings of these interactions between personal contextual cues and the effects of portion size as well as the social setting contributed to addressing the knowledge gap in the extant literature.

As expected, social modelling was not found in this study. Due to the low social visibility condition in Study 2, it was hard to determine the amount consumed by eating partners. Therefore, the amount consumed by every participant in one experimental session was not correlated. It is commonly known that consumers do monitor the amount consumed by eating partners when they are eating in the presence of other individuals(s) and adjust their consumption accordingly. [Given that individuals often look for norms of appropriateness \(Herman & Polivy, 2005\)](#), the current research suggests that the monitoring process is spontaneous and habitual. Therefore, when the monitoring process becomes hard due to low social visibility, participants did not adjust their consumption according to the amount their eating partners (i.e. the other participants) consumed.

Lastly, the current research found that the relationship between the effect of portion size and social setting is influenced by social visibility. With the intention of reducing the negative effects of portion size, the main research interest of the current research was to examine if the effect of portion size is moderated by the social setting. With hypothesis *H6* being supported in Study 2, the current research concludes that the adverse effect of portion size can only be reduced by eating in a social setting when the social visibility is sufficiently high. However, this is only true when the eating duration is controlled at an appropriate level. Specifically, consumers should cut down their time being exposed to extra food in a social eating event.

The following chapter, Chapter 6.0, presents a general discussion of the findings in the current research. The limitations of the research and avenues for further study are also outlined.

6.0 GENERAL DISCUSSION

Chapters 4.0 and 5.0 described and discussed Studies 1 and 2 and outlined how these studies meet the research objectives of this research. These objectives were to examine the combined main effects (the effects of portion size and social setting), the possible moderators of the main effects, and the effect of social modelling. On top of this, the current research also aims to examine the directionality of social effect and the effect of social visibility on the combined main effects and social modelling. The focus of this chapter is to compare the research findings obtained in Study 1 and Study 2 and to identify the effect of social visibility on the research interests of the current study. Five research questions were developed to examine the research objectives. These are listed below:

Research Question 1: Will consumers respond differently to an increase in portion size in the presence of others than when they are alone?

Research Question 2: Does social visibility have an impact on the relationship between the effect of portion size and social setting?

Research Question 3: Will individuals consume more or less when eating with other individuals given the known context effects being controlled?

Research Question 4: Will the amounts consumed by individuals correlate to the amounts consumed by other individuals in the same eating event?

Research Question 5: Will personal characteristics influence the effect of portion size and social setting?

Research Question 5a: Will the influence of portion size be affected by individuals' restrained eating levels?

Research Question 5b: Will the influence of social setting be affected by individuals' restrained eating levels?

Research Question 5c: Will the influence of portion size be affected by individuals' self-esteem levels?

Research Question 5d: Will the influence of social setting be affected by individuals' self-esteem levels?

The findings of the current research are summarised in Table 20 below. Using two experimental studies, this thesis explored the effect of social visibility. Study 2 was an exact replication of Study 1 except with the level of social visibility reduced. The effect of social visibility on the contextual effects in the study were examined by comparing the findings of these two studies. These findings are discussed in the following subsections.

Table 20: Summary of hypothesis testing

	Hypothesis	Study 1	Study 2
<i>H1</i>	Increasing the portion size will result in an increase in the amount consumed.	Not supported	Supported
<i>H2</i>	Eating in the presence of other individual(s) will cause a change in the amount consumed when compared to eating alone.	Supported	Supported
<i>H3</i>	The portion size effect will be moderated by the presence of other individuals in an eating event.	Supported	Not supported
<i>H4a</i>	Self-esteem will moderate the portion size effect.	Not Supported	Supported
<i>H4b</i>	Restraint will moderate the portion size effect.	Not Supported	Supported
<i>H4c</i>	Self-esteem will moderate the social effect.	Not Supported	Supported
<i>H4d</i>	Restraint will moderate the social effect.	Supported	Supported
<i>H5</i>	The amounts eaten by individuals in a social setting will be correlated.	Supported	Not supported
<i>H6</i>	The relationship between portion size and social setting will be influenced by the level of social visibility.	Supported	

6.1 The Portion Size Effect

In line with the studies in the extant literature (e.g. Cavanagh et al., 2014; Marchiori, Papies, & Klein, 2014), the current research demonstrates the portion size effect, that increasing the portion size will result in an increase in the amount consumed. This was tested by examining hypothesis *H1*. Hypothesis *H1* is supported in Study 1 when participants eating in a social setting were removed from the analysis. However, the portion size effect was masked by the effect of the social setting in Study 1 due to the high level of social visibility. Hypothesis *H1* is supported in Study 2 (low social visibility condition) without removing participants eating in a social setting from the analysis. Unlike Study 1, the portion size effect was not masked by the social effect in Study 2. This is due to the low level of social visibility in Study 2. Hence, it is concluded that the robust effect of portion size that are consistently reported in studies (see Zlatevska *et al.*, 2014) is demonstrated in this thesis.

Both Study 1 and Study 2 show that consumers consume more when they are given a larger portion of food. The insignificance of the portion size effect in Study 1 was due to the fact that portion size effect was being masked by the effect of the social setting. This conclusion was derived by repeating the hypothesis testings in Study 1 with data that excluded the participants eating in a social setting (see Section 4.3.3). The portion size effect that became statistically significant in Study 1 when the participants were eating in a social setting was removed from the analysis, which implies that the portion size effect was masked by the social effect due to the research design. This provides support for Herman *et al.*'s (2003) assertion that among many known contextual cues, the social effect is the strongest contextual cue for consumption behaviour. The conclusion of the portion size effect being masked by the effect of social setting is further supported by the fixed unit effect (Davis, Bui, & Payne, 2014) as outlined in the following paragraph.

Despite the robust effect of portion size being consistently reported (see Zlatevska *et al.*, 2014), the finding that the portion size effect was only found to be significant in Study 1 when participants eating in a group were removed from the analysis is not a contradictory finding. As explained in the previous paragraph, the portion size effect was masked by social effect and this is congruent with the prediction of Herman *et al.* (2003) and the fixed-unit effect reported in Davis *et al.*'s (2014) empirical study. Davis *et al.* found that by manipulating the unit size of the food (for example, larger slices of pizza versus smaller slices of pizza), individuals consumed a fixed unit of food (e.g. a fixed number of pizza slices) regardless of the unit size when they were eating in a group. In their experiments, Davis *et al.* showed that consumers who were eating in a group did not respond to the unit size but consumers who were eating alone did respond to the unit size. This is due to the fact that the effect of unit size was eliminated by the social effect and this finding was named the fixed-unit effect by Davis *et al.* Similarly, the portion size effect in Study 1 of the current research was eliminated by the social effect. The contextual effect of the social setting was strong in Study 1 such that the portion size effect did not influence the amount consumed by participants. Therefore, the conclusion of portion size effect being masked by social effect is supported by the fixed-unit effect (Davis *et al.*, 2014).

Up to this point, the insignificance of hypothesis *H1* in Study 1 when social eating is not excluded from the analysis has already been explained by the portion size effect being masked by social effect. However, the question about portion size effect being masked by the social effect in Study 1 but not Study 2 then emerges. Due to the identical experimental method used in both studies, identical findings in both studies would be expected. However, the food served in both experiments were altered deliberately to generate different levels of social visibility. Therefore, the difference found in Study 1 and Study 2 is explained by social visibility. The M&M's chocolates (one gram per unit; image in Appendix B) that were used in Study 2 are much smaller than the Arnott's Nice biscuits (12 grams per unit; refer Appendix A for the image) that were

used in Study 1. Smaller unit size food that has lower visibility makes the consumption of an individual's eating partner(s) harder to track. Therefore, as social visibility is much lower in Study 2, the consumption behaviour of the other participants that the subjects are eating with was more difficult to see. Consequently, the social effect was not sufficiently substantial to eliminate the effect of portion size in Study 2.

In summary, the portion size effect was masked by the social effect in Study 1 but not in Study 2. The finding that the portion size effect was masked by social effect in Study 1 is supported by the theory of the fixed-unit effect (Davis *et al.*, 2014). However, the theory of the fixed-unit effect is not applicable in Study 2 due to the lower level of social visibility caused by the smaller unit size of food served in Study 2. Although Davis *et al.* (2014) also manipulated the unit size (small versus large) in their studies, the unit sizes in both the small and large experimental conditions of their studies were not sufficiently small enough to reduce the social visibility. Therefore, the fixed-unit effect is applicable to all experimental conditions in Davis *et al.*'s study. It is predicted that the fixed-unit effect would be eliminated in Davis *et al.*'s studies if the unit sizes were sufficiently small to dampen the effect of social setting.

6.2 Social Effect

Besides the manipulation of portion size, the current research also manipulated the social setting as an independent variable. The effect of the social setting was found in both studies. Through examining the research hypothesis *H2*, the current research show a difference in the amounts consumed by individuals who are eating with other individuals in comparison to consumers who are eating alone. Generally, the social effect can be categorised into three distinct areas of literature (see de Castro & de Castro, 1989; Herman *et al.*, 2003): social facilitation, social modelling and impression management. Based on the extant literature, social facilitation is generally expected when participants eating in a social setting are exposed to palatable food for

a sufficiently long duration. Social modelling is generally expected in empirical research where participants are eating with a confederate who eats at a pre-determined level. Impression management is often expected when consumers are eating in the presence of other individuals who are presumably observing or judging the amount they consume. From the extant empirical findings, it has been found that certain traits such as gender (e.g. Mori *et al.*, 1987) and weight (e.g. de Luca & Spigelman, 1979) can trigger specific consumers to think that their consumption is being judged. In summary, the social effect is widespread; however, there are many questions about the effect of eating in a social setting remain unanswered. For example, it has not been clearly established if consumers would consume more or less when they are eating in social setting. Based on the extant findings, although the direction of the social effect can be rather predictable at times, the current research aims to investigate the effect of social influence in a common situation (i.e. what happens when we are eating in the presence of other individuals). This prevents practical implications from being derived from the findings on social effect.

Although the social effect is reported in many studies (see Herman *et al.*, 2003), the directionality of this effect remains unanswered. Mixed results on the social effect are reported in the extant literature; depending on the conditions (e.g. eating duration, presence of confederate and consumers of specific traits), consumers either increased or decreased their consumption amount when they ate in a social setting. Due to the fact that the social effect is circumstantial, as discussed in the previous paragraph and summarised in Figure 1, the current research was designed such that neither social facilitation nor social suppression is primarily expected.

Such design includes but is not limited to keeping the duration of consumption consistent in every experimental session, the random allocation of participants in different experimental sessions and not using a confederate who consumes a predetermined amount of food. With known contextual effects controlled, the current research found that consumers who are eating in a social setting

tend to reduce the amount they consume. Therefore, the current research concludes that impression management is generally expected when consumers are eating in the presence of other individuals. The finding reported in this thesis is consistent with Vartanian *et al.*'s (2015) meta-analysis finding, where the suppression effect tends to be stronger than facilitating effect in social modelling studies. Nevertheless, it remains uncertain whether social facilitation will be observed instead of social suppression if the eating duration of the experimental studies in the current research were sufficiently extended. Therefore, future research can examine the effect of social setting with different eating durations.

Social modelling has always been reported in empirical studies that consist of two individuals eating together (e.g. Herman *et al.*, 2005; Hermans *et al.*, 2012b). Researchers in the extant literature have only demonstrated social modelling by inviting participants to their experiments one at a time in each experimental session to eat with another individual (often a confederate). Besides studies that use two acquainted models (Howland *et al.*, 2012) and multiple remote confederates (e.g. Leone *et al.*, 2007; Roth *et al.*, 2001), social modelling has always been studied dyadically. The current research aims to investigate if social modelling can also be found in a larger eating group and the interaction between portion size and social modelling of a larger group. In order to examine this, correlation tests were performed in both Study 1 and Study 2 to check if the amounts consumed by those four participants in an experimental session are correlated. Based on the correlation tests shown in Section 4.3.2, the amounts consumed by the participants in Study 1 who are eating in a group of four are correlated. However, this relationship is qualified by social visibility. This was shown through Hypothesis *H5* being supported in Study 1 but not in Study 2. Although social modelling was found in Study 1 (see the correlation tests in Section 4.3.2), social modelling was not found in Study 2 (see the correlation tests in Section 5.3.2). An explanation for this phenomenon is that the spontaneous tracking of eating partners' consumption amount becomes harder when the social visibility is low. Therefore, social

modelling was not observed in Study 2 but was observed in Study 1. Based on these findings, the current research concludes that social modelling does exist among consumers who are eating with more than one individual in a natural setting given that the social visibility is sufficiently high.

The current research has also gained further understanding of the intricacies of the social effect. Although it was shown that individuals conform to the group's eating behaviour, the current research also illustrates that an individual's behaviour can be separated from the group's behaviour. That social modelling was observed in Study 1 when social visibility is high shows that individuals conform to the group's behaviour. On the contrary, the failure to detect social modelling in Study 2 when the level of social visibility was reduced shows that individuals' behaviour can be separated from the group's behaviour. Thus, social visibility is shown to be an important contextual effect that influences the effect of the social setting.

The different effects of the social setting (e.g. social facilitation, social modelling and impression management) have always been studied separately. Herman *et al.* (2003) gathered these effects in one paper and presented a meticulous discussion, highlighting their commonalities. The effect of social settings is circumstantial; the current research summarised these different effects of social setting under different circumstances in Figure 1. The current research observed impression management and social modelling among consumers in both of the experimental studies. In other words, consumers who are eating in a group tend to reduce the amount they consume and the amount consumed by an individual is correlated to the amount consumed by eating partners. Thus, this thesis suggests that social facilitation and impression management are the subsets of social modelling. It is concluded that social modelling coexists with either social facilitation or social suppression (i.e. impression management) when consumers are eating in a social setting with a high enough level of social visibility so that the social norms are clear. Under

a high social visibility condition, social modelling is expected when consumers are eating in a social setting. Depending on the contextual effects, such as eating duration and familiarity with eating partner(s), either social facilitation or impression management is expected.

Apart from identifying the directionality and examining the different types of social effect, the current research also aimed to verify the mechanism that is most widely used to explain social facilitation: the time-extension hypothesis proposed by de Castro (1994). Similarly, Pliner *et al.* (2006) suggest that extending the time of exposure to food causes the social facilitation effect. Since participants' eating durations were kept consistent across every experimental condition in the current research, the failure to detect social facilitation supports the time-extension hypothesis. On the contrary, observing social facilitation in the current research disapproves the time-extension hypothesis as the explanation for social facilitation. Failing to detect social facilitation in the current research supports the time-extension hypothesis and suggests that it is worth investigating the time-extension hypothesis further in future research. However, as there is insufficient evidence in the current research to draw any conclusions about the time-extension hypothesis, additional evidence is required to test for time-extension hypothesis.

Brindal *et al.* (2011) conclude that the time-extension hypothesis itself is insufficient to explain the social facilitation effect in their empirical study. By observing consumers that ate alone in a fast food restaurant, Brindal *et al.* found no correlation between consumers' consumption amount and the duration of stay in a fast food restaurant. However, the observation method employed in their study did not allow for an extended time of exposure to food directly. Based on this non-correlated relationship, Brindal *et al.* concluded that the time-extension hypothesis itself lacks accountability in explaining the effect of social facilitation. However, the subjects in Brindal *et al.*'s study who extended their stay in the fast food restaurant only extended their time of exposure to the food environment, not to food directly. In other words, consumers who extended their stay

in a fast food restaurant after finishing their meals did not have extra food readily available on their tables. This condition differed from the studies of de Castro (1994) and Pliner *et al.* (2006), who suggest the time-extension hypothesis as an explanation for social facilitation. Therefore, the current research suggests that in order to test for time-extension hypothesis, participants should have instant access to food throughout the extended meal duration. The current research concludes that the time-extension hypothesis remains as a possible explanation for social facilitation.

Using a round table with four seatings and a container of snacks positioned between the seat and name tag in each seat (refer Appendix E), the current research ensured every participant had the same level of ease in reaching to the food provided to them. This layout was designed to avoid the undesirable contextual effects caused by different levels of ease in reaching to food. In addition to this, the layout of this experimental study made certain that every participant received the same treatment. According to Wansink (2004; 2010), the ease of access to food is an important contextual cue to be taken into consideration. Wansink (2010) suggests that convenience is one of the ways to alter the food environment that is being exposed to consumers, so in order to reduce food consumption, access to food should be made less convenient. Therefore, the current research highlights the difference between an extended meal duration with extra food that is readily available and an extended meal duration without extra food being readily available. Even though subjects in Brindal *et al.*'s (2011) study could have purchased more food in the fast food restaurant for their extended stay in the restaurant, the ease of access to food would have influenced the consumption behaviour. The current research concludes that the direct extended exposure to food is required to verify the time-extension hypothesis as the mechanism of social facilitation.

6.3 Combined Effect of Portion Size and Social Setting

Through examining the research hypothesis *H3*, the current research concludes that social setting moderates the effect of portion size **when the social visibility is high**. However, the relationship between social setting and portion size is found to be qualified by social visibility. Due to the manipulated level of social visibility, the relationship between social setting and portion size was found to be interactive in Study 1 but not in Study 2. Although this difference appeared to be inconsistent, these findings are not contradictory. The social effect was stronger in Study 1 because of the higher level of social visibility; thus, the effect of portion size was qualified by the social setting in Study 1. However, the level of social visibility in Study 2 was lower, hence the social effect was not sufficiently strong to moderate the effect of portion size. Consequently, the portion size effect was not qualified by the social setting but acted additively in Study 2. As outlined in Section 1.2, the current research aimed to investigate if consumers respond differently to an increase in portion size in different social settings and if the relationship between portion size and social setting is qualified by social visibility. The findings in the current research conclude that the influence of portion size on individuals' consumption amounts is dependent on the social setting when social visibility is high.

6.4 Influences of Personal Characteristics

The influence of self-esteem and restraint on consumers' consumption amount are found to be statistically significant in Study 2 but not in Study 1. This can be explained by the different social visibility in both studies. Study 1 has higher social visibility and it may have eliminated the influences of personal contextual cues such as self-esteem and restraint. When the social norms are clear due to high social visibility, consumers are more influenced by social norms and less influenced by personal contextual cues such as self-esteem and restraint. Similarly, when social norms are vague due to low social visibility, consumers are more influenced by personal

contextual cues and less influenced by social norms. Therefore, the amount consumed by participants in Study 2 were influenced by personal contextual cues on top of the social setting. The social norms set by eating partners in Study 2 were weakened by the low social visibility and hence the influences of personal contextual cues were not eliminated. Nevertheless, the directions of these influences are the same in both studies.

The results also showed that participants with lower self-esteem consumed less food and participants who are more restrained consumed less food. Although self-esteem and restraint were only found to be significant in Study 2, the effects of these personal contextual cues are the same in both studies, even with the different levels of social visibility. On top of this, portion size was found to be moderated by these personal contextual cues when social visibility is low. When consumers are eating from a small portion, consumers with low self-esteem consumed more food. Similarly, consumers who are more restrained consumed more food when the portion size is small. This true in both studies, although the interaction of portion size with self-esteem and restraint was not statistically significant in Study 1 because the effect of portion size was masked by the social effect. These findings were demonstrated through the positive B-value of the interactions between small portion and low self-esteem as well as small portion and restraint in the GLM analysis of both studies. Thus, the current research concludes that the influence of personal contextual cues such as self-esteem and restraint are qualified by social visibility. Additionally, portion size effect is moderated by these personal contextual cues when the social visibility is low.

The current research also demonstrates that the effect of social setting is dependent on consumers' self-esteem levels when social visibility is low. This is evidenced through hypothesis *H4c*, which posits that self-esteem will moderate the social effect, being supported in Study 2 (low social visibility condition) but not in Study 1 (high social visibility condition). When the

social visibility is high and the social norms set by eating partners is clear, consumers are highly influenced by the social effect and, hence, the social effect is not moderated by self-esteem. Self-esteem only moderates the effect of the social setting when the social norm is vague due to low social visibility. From the empirical evidence, it is shown that low self-esteem consumers who are eating alone eat less. However, the effect of the social setting is dependent on consumers' restraint regardless of the social visibility. These findings show that the influence of self-esteem on the effect of social setting is more susceptible to social visibility than the influence of restraint eating on the effect of social setting. Since research hypothesis *H4d*, which posits that restraint will moderate the social effect, is supported in both Study 1 and Study 2, the current research concludes that the effect of social eating being dependent on restraint is not qualified by social visibility. Both of the experimental studies in the current research show that restrained consumers who are eating alone eat less. This finding shows that restrained consumers are watching their dietary intakes and are less influenced by the effect of the social setting, even when the social norms set by eating partners are clear.

In summary, when social visibility is low, self-esteem and restraint have an effect on the amount consumed, in that the portion size effect is moderated by self-esteem and restraint while the social effect is moderated by self-esteem. However, the effect of the social setting being moderated by restraint does not depend on social visibility.

6.5 Summary

In conclusion, the robust effect of portion size is moderated by social setting and social visibility; that is, how much consumers increase their consumption by due to a larger portion of food being served not only depends on whether they are eating alone or eating in a social setting, it also depends on how visible the consumption behaviour of their companions is. However, the effect

of portion size is only found to be moderated by social setting when the level of social visibility is high.

Opposing effects of social setting have been reported in the existing literature. Under different circumstances, the amounts consumed by consumers either increase or decrease when they are eating in a social setting. With all known contextual cues being controlled, it was found that consumers tend to reduce the amount they consume when they are eating in a social setting when compared to when they are eating alone. In addition to this, consumers tend to adjust the amounts they consume based on the amounts consumed by their eating partners. Nevertheless, consumers only adjust their consumption amount according to the amount consumed by their eating partners when the visibility is high enough that the social norms are clear.

Social visibility has an enormous role in the influences of various contextual cues when consumers are eating in a social setting. When the social visibility is high in a social eating condition, the amount consumed by consumers is not influenced by the effect of portion size and self-esteem but are by restraint and social setting. However, when the social visibility is low, consumers who are eating in a group are influenced by the effect of portion size, self-esteem, restraint and social setting. Lastly, the portion size effect was found to be moderated by self-esteem and restraint when the level of social visibility is low. However, while the social effect was found to be moderated by restraint regardless of the level of social visibility, the social effect is only moderated by self-esteem in low social visibility.

6.6 Limitations and Future Research

One of the limitations in the current research is that the eating duration of the experimental sessions were fixed at five minutes across all experimental conditions. This measure was used to make sure that the contextual effects under investigation are not explained by other variables like

eating duration. Consequently, it is left unsure if social facilitation instead of social suppression would be observed when the eating duration is sufficiently extended. Although Pliner et al. (2006) show that extended eating duration would increase the amount consumed by individuals, three propositions discussed in Chapter 2.0 (larger intake when eating with others, non-strangers and larger group) suggested by Herman (2015) describe the mechanism of social facilitation in a more comprehensive way.

The use of snack food in the current research may limit its generalisability to the context of snack food. Although it is not sure if the results obtained in the current research can be generalised in a broader context which may include main course, dessert or beverage, the empirical findings derived from the current research is conclusive in the context of snack food. This leads to another interesting avenue for future research looking into the effects under study with different types of food.

Another limitation of the current research is that the social visibility was manipulated by using different food types that have different sizes and social visibility was manipulated in two different experiments that were performed separately. However, the treatments were exactly the same and the subjects were drawn from the same population. With all the efforts to keep these two experiments as similar as possible, these limitations became less critical.

The number of participants in every experimental session of the current research was fixed at four. Given that the social visibility was shown to have an effect on the amount consumed by consumers, the group size effect which would affect the level of social visibility is identified as an interesting research gap for the future research. The effect of group size has been shown in a number of studies (e.g. Bellisle et al., 1999; Clendenen et al., 1994; de Castro & Brewer, 1991).

However, mixed results of group size effect were found in the extant empirical studies. The following paragraphs outline the extant findings on group size effect.

The effect of group size on food consumption behaviour was first reported by de Castro and de Castro (1989). In a series of social facilitation studies carried out by John M. de Castro and his colleagues (e.g. Bellisle *et al.*, 1999; de Castro & de Castro, 1989; de Castro, 1991; Redd & de Castro, 1992), group size (the number of people present) was shown to be positively correlated with meal size (i.e. the amount consumed). de Castro and his colleagues referred to this finding as social correlation. However, the current research avoided using social correlation as the terminology for this finding, as this terminology is easily confused with social modelling. Therefore, the term group size effect was chosen for use in the current research to avoid the potential confusion.

Through well-developed measures, de Castro and Brewer (1991) further explored social correlation and reported that the amount consumed by individuals is a power function of the number of others present. However, the empirical results obtained by Clendenen *et al.* (1994) and Pliner *et al.* (2006) do not support the power function model of social facilitation reported by de Castro and Brewer (1991). Although the empirical research conducted by Clendenen *et al.* (1994) and Pliner *et al.* (2006) reported that consumers eating in a group of two consume more food than consumers eating alone, those findings did not support the power function model. In contrast to the power function model of social facilitation reported by de Castro and Brewer (1991), Clendenen *et al.* (1994) and Pliner *et al.* (2006) showed that consumers consume more food when they are eating in a group of two than when eating in a group of four.

The number of individuals eating in a group clearly has an effect on the amount consumed by consumers (e.g. de Castro & Brewer, 1991; Clendenen *et al.*, 1994). However, reports on this

effect varies. This may be due to the experimental methods and other contextual effects. The power function model of social facilitation has always been shown in empirical research that uses the dietary diary method (e.g. Bellisle *et al.*, 1999; de Castro & de Castro, 1989) where the eating duration was not controlled. Although Pliner *et al.* (2006) found no group size effect in their empirical study in which the eating duration was controlled, the group size used in that study may be insufficiently large to alter the social visibility. Therefore, the current research suggests that group size effect should be tested in future research.

6.6.1 *Students as Subjects*

Although using students as the sample in the current research can be a limitation in that it may raise the question of the applicability of findings in a real world scenario, this is not the case in this research. According to Kardes (1996), useful and informative data about basic psychological processes can be obtained through student samples. This is because the importance of process generalisation outweighs the importance of effect generalisation in a basic research (Calder, Phillips, & Tybout, 1981; Calder, Phillips, & Tybout, 1982; Mook, 1983) and that the basic research focuses on relative effects instead of absolute effects (Kardes, 1996). With carefully controlled studies and well-developed measures, relative effects provide information about moderating variables and mediating processes. In general, the information about the moderating variables and mediating processes is vital for the aim of explaining behaviour (Baron & Kenny, 1986). On the contrary, absolute effects are crucial for the aim of predicting specific behaviours (Petty & Cacioppo, 1996, cited in Kardes, 1996, p. 281). The main objective of the current research is to identify the moderators for the effects of portion size and social setting on the amount of food consumed by consumers. Therefore, the use of a student sample is appropriate in the current research.

The generalisability of the results obtained from student samples is another common question raised in the design of a controlled experiment due to the use of representative heuristic (Kardes, 1996). For example, in America, students are perceived to be younger, smarter, more educated and less experienced than the typical consumer (Kardes, 1996). However, the attribution effect often exaggerates the perceived relevance of these dispositional differences (Kardes, 1996). Representative heuristic and attribution effects tend to cause an individual to focus on comparatively negligible dispositional differences and to neglect the vital similarities in traits such as physiology, neurology and cognition that are more inconspicuous. On top of this, research shows that huge variations in experience level often render exceptionally small effects on many basic judgement tasks as only a little is typically learnt from unstructured experience (Holland, Holyoak, Nisbett & Thagard, 1986, cited in Kardes, 1996, p. 286). One does not learn much from the experience when the relations among the variables are probabilistic; however, when the relations among the variables are deterministic, one can learn from the experience (Brehmer, 1980, cited in Kardes, 1996, p. 287). Therefore, these dispositional differences are deemed less important in the context of the current research and the use of student samples is justified.

Empirical findings obtained by reviewing, comparing and contrasting a series of different studies conducted in laboratory and in field settings shows that student samples and non-student samples do not differ (Locke, 1986, cited in Kardes, 1996, p. 288). Locke finds that the empirical findings derived from studies conducted in laboratory settings using student samples correlate closely to the empirical findings derived from studies conducted in field settings using non-student samples. This is true for all of the main phenomenon studied in industrial-organisational psychology, organisational behaviour and human resource management (Locke, 1986, cited in Kardes, 1996, p. 288). In addition to this, laboratory research that uses student samples has greater efficiency at a lower cost when compared to a field research that uses non-student samples.

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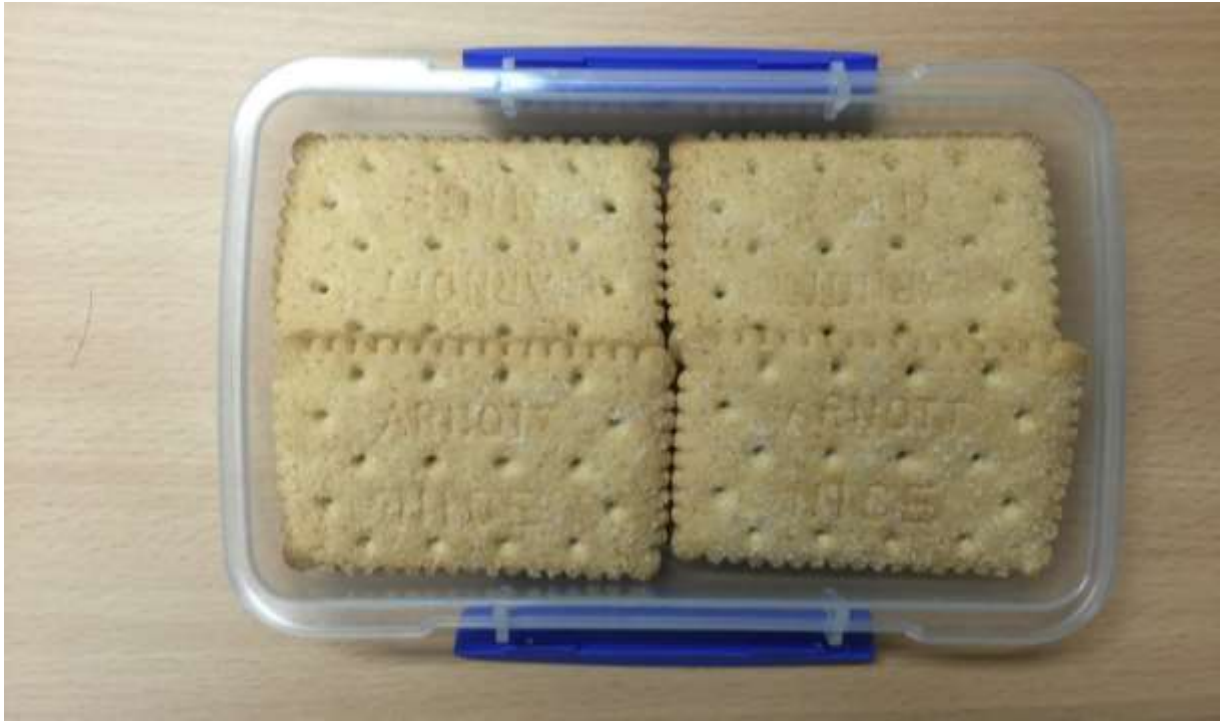
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8.0 APPENDICES

Appendix A – Image of Arnott's Nice biscuits in a container



Appendix B – Image of M&M's chocolates in a container



Appendix C – Cubicles for eating alone experimental condition



Appendix D – Cubicle setup for eating alone experimental condition



Appendix E – Round table setup for social eating experimental condition



Appendix F – Round table setup for focus group study (Cover Study)



Appendix G – Script used in every experimental session

- Welcome and thank the participants
- Ask participants to silent their phones and place their belongings at the corner.
- How participants their seats

[Focus Group Study]

- In the following discussion,
 - There is no right or wrong answer.
 - I will not be part of the discussion.
- I will first introduce myself. Then you will introduce yourself to the group.
- First topic of this discussion: The Most Wanted Holiday Destination
 - Involves some favourable imaginations
 - Now, imagine if **time and money** is not an issue
 - **Forget** about all commitments and responsibilities that you currently have
 - It can be **anywhere** in the world at no cost
 - **WHERE** WOULD YOU LIKE TO BE RIGHT NOW!?
 - Please share with the group what are the things that you want to see or do in your most wanted holiday destination.
- Please work together as a group and list out **7 wonders of the world**
- Please come up with a **consensus** in the group and name cities in Australia that you think they are the best **in descending order**.
- Please discuss with the group members and list **10 or 15 countries in Asia and 10 or 15 countries in Europe**

- Please share with the group members, which was the **most enjoyable holiday** that you have ever experience so far? It may be a holiday trip to somewhere or a festive holiday celebration that you think it was the most enjoyable one.




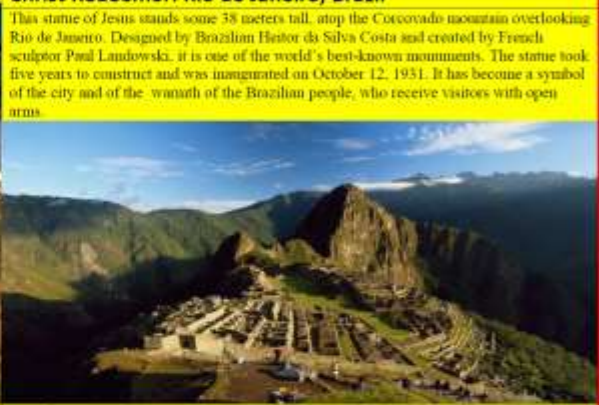

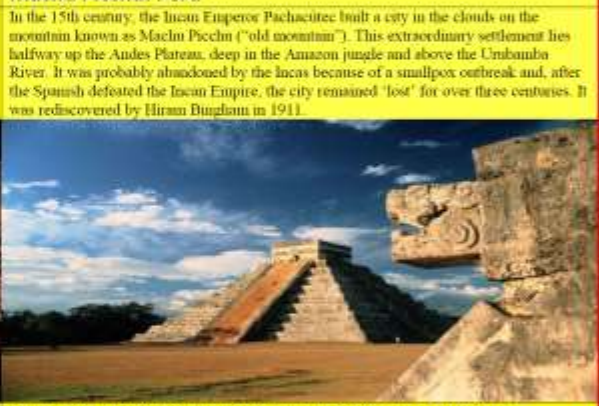

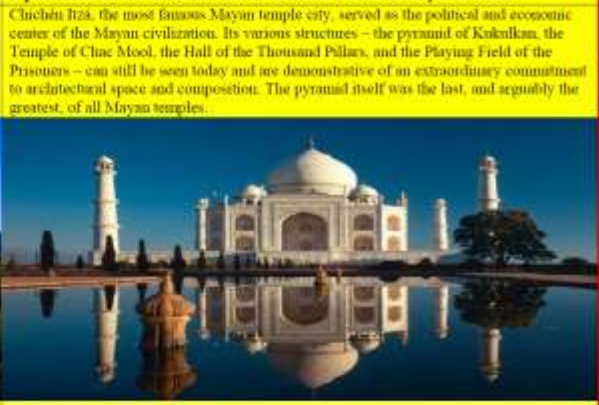
[Eating Phase]

- I need to be away for a while to prepare for the next section of this session.
- SOCIAL EATING CONDITION:
 - Meanwhile, we have prepared some snacks for you while I am away as a thank you for taking part in this survey. So, please feel free to have as many as you like and enjoy chatting among yourself while I am away. I will be right back very soon.
 - Let's move to the next table.
- ALONE EATING CONDITION:
 - From now onwards, please do not discuss with the group anything related or not related to this study. Later, you will be waiting in the cubicles while I am away. Please do not use the PC first, you may read the posters on the 7 wonders. We have also prepared some snacks for you while I am away as a thank you for taking part in this survey. So, please feel free to have as many as you like and I will be right back very soon.
 - Let's move to the cubicles

[Questionnaire]

- Thank you very much. You may now go to the cubicle that has your name and answer the questionnaire. You will find an IE sign at the bottom left of the screen, click on it and you are ready to go.
- Please feel free to raise any question that you may have. I will be here at all times.

Appendix H – Poster of the Seven Wonders of the World

 <h3>New 7 Wonders of the World</h3> <p>Adapted from www.new7wonders.com and news.nationalgeographic.com</p>	
 <h4>Christ Redeemer: Rio de Janeiro, Brazil</h4> <p>This statue of Jesus stands some 38 meters tall, atop the Corcovado mountain overlooking Rio de Janeiro. Designed by Brazilian Heitor da Silva Costa and created by French sculptor Paul Landowski, it is one of the world's best-known monuments. The statue took five years to construct and was inaugurated on October 12, 1931. It has become a symbol of the city and of the warmth of the Brazilian people, who receive visitors with open arms.</p>	
 <h4>Great Wall of China: China</h4> <p>The Great Wall of China was built to link existing fortifications into a united defense system and better keep invading Mongol tribes out of China. It is the largest man-made monument ever to have been built and it is disputed that it is the only one visible from space. Many thousands of people must have given their lives to build this colossal construction.</p>	 <h4>Machu Picchu: Peru</h4> <p>In the 15th century, the Inca Emperor Pachacutec built a city in the clouds on the mountain known as Machu Picchu ("old mountain"). This extraordinary settlement lies halfway up the Andes Plateau, deep in the Amazon jungle and above the Urubamba River. It was probably abandoned by the Incas because of a smallpox outbreak and, after the Spanish defeated the Inca Empire, the city remained "lost" for over three centuries. It was rediscovered by Hiram Bingham in 1911.</p>
 <h4>Petra: Jordan</h4> <p>On the edge of the Arabian Desert, Petra was the glittering capital of the Nabataean empire of King Aretas IV (9 B.C. to 40 A.D.). Masters of water technology, the Nabataeans provided their city with great tunnel constructions and water chambers. A theater, modelled on Greek-Roman prototypes, had space for an audience of 4,000. Today, the Palace Tombs of Petra, with the 42-meter-high Hellenistic temple facade on the El-Deir Monastery, are impressive examples of Middle Eastern culture.</p>	 <h4>Pyramid at Chichén Itzá: Yucatan Peninsula, Mexico</h4> <p>Chichén Itzá, the most famous Mayan temple city, served as the political and economic center of the Mayan civilization. Its various structures – the pyramid of Kukulcan, the Temple of Chac Mool, the Hall of the Thousand Pillars, and the Playing Field of the Prisoners – can still be seen today and are demonstrative of an extraordinary commitment to architectural space and composition. The pyramid itself was the last, and arguably the greatest, of all Mayan temples.</p>
 <h4>Roman Colosseum: Rome, Italy</h4> <p>This great amphitheater in the centre of Rome was built to give favors to successful legionnaires and to celebrate the glory of the Roman Empire. Its design concept still stands to this very day, and virtually every modern sports stadium some 2,000 years later still bears the irresistible impact of the Colosseum's original design. Today, through films and history books, we are even more aware of the cruel fights and games that took place in this arena, all for the joy of the spectators.</p>	 <h4>Taj Mahal: Agra, India</h4> <p>This immense mausoleum was built on the orders of Shah Jahan, the fifth Muslim Mogul emperor, to honor the memory of his beloved late wife. Built out of white marble and standing in formally laid-out walled gardens, the Taj Mahal is regarded as the most perfect jewel of Muslim art in India. The emperor was consequently jailed and, it is said, could then only see the Taj Mahal out of his small cell window.</p>



New 7 Wonders of Nature

Adapted from www.new7wonders.com and news.nationalgeographic.com



Ha Long Bay: Vietnam

The bay features thousands of limestone karsts and isles in various sizes and shapes. Several of the islands are hollow, with enormous caves, other support floating villages of fishermen, who ply the shallow waters for 200 species of fish and 450 different kinds of mollusks. Another specific feature of Halong Bay is the abundance of lakes inside the limestone islands, for example, Dau Be island has six enclosed lakes. All these island lakes occupy drowned dolines within fengcong karst.



Jeju Island: South Korea

Jeju is a volcanic island, 130 km from the southern coast of Korea. The largest island and smallest province in Korea, the island has a surface area of 1,846 sq km. A central feature of Jeju is Hallasan, the tallest mountain in South Korea and a dormant volcano, which rises 1,950 m above sea level. 360 satellite volcanoes are around the main volcano.



PP Underground River: Philippines

Puerto Princesa Subterranean River National Park features a limestone karst mountain landscape with an 8.2 km navigable underground river. A distinguishing feature of the river is that it winds through a cave before flowing directly into the South China Sea. The underground river is reputed to be the world's longest. At the mouth of the cave, a clear lagoon is framed by ancient trees growing right to the water's edge. Monkeys, large monitor lizards, and squirrels find their niche on the beach near the cave.



Amazon: South America

The Amazon represents over half of the planet's remaining rainforests and comprises the largest and most species-rich tract of tropical rainforest in the world. The Amazon River is the largest river in the world by volume, with a total flow greater than the top ten rivers worldwide combined. It accounts for approximately one-fifth of the total world river flow and has the biggest drainage basin on the planet. Not a single bridge crosses the Amazon.



Iguazu Falls: Argentina/Brazil

Iguazu Falls, in Iguazu River, are one of the world's largest waterfalls. They extend over 2,700 m (nearly 2 miles) in a semi-circular shape. Of the 275 falls that collectively make up Iguazu Falls, "Devil's Throat" is the tallest at 80 m in height. Iguazu Falls are on the border between the Brazilian state of Paraná and the Argentine province of Misiones, and are surrounded by two National Parks (BR/ARG). Both are subtropical rainforests that are host to hundreds of rare and endangered species of flora and fauna.



Komodo: Indonesia

Indonesia's Komodo National Park includes the three larger islands Komodo, Rinca and Padar, as well as numerous smaller ones, for a total area of 1,817 square kilometers (603 square kilometers of it land). The national park was founded in 1980 to protect the Komodo dragon. Later, it was also dedicated to protecting other species, including marine animals. The islands of the national park are of volcanic origin.



Table Mountain: South Africa

Table Mountain is a South African icon and the only natural site on the planet to have a constellation of stars named after it – Mensa, meaning "the table." The flat-topped mountain has withstood six million years of erosion and hosts the richest, yet smallest floral kingdom on earth with over 1,470 floral species. Table Mountain boasts numerous rare and endangered species. It is the most recognized site in Cape Town, the gateway to Africa, owing to its unique flat-topped peaks which reach 1,086 m above sea level.



Please do not talk

**IMPORTANT: Please remain seated without any discussion
when the experimenter is away.**

Appendix J – Questionnaire survey given at the end of the experimental session

Welcome to Bond University Business Faculty Research on factors that influence individual's holiday destination preferences

Ethics Reference Number: RO – 1736

My name is Marcus Chee Tiong Tan and I am currently completing PhD (Business) at Bond University under the supervision of Professor Chris Dubelaar and Assistant Professor Natalina Zlatevska. I am conducting a research investigation into trends in tourism and holiday destinations. As a part of this research, I would like to invite you to complete a survey. The details of the research study are outlined below.

In this research we explore the factors that influence people's preferences for vacation destinations. We first conduct a focus group to discuss people's experiences on vacation. We then ask participants to complete a short survey. There are no right or wrong answers. We are only interested in your opinions.

Your responses in the survey will be completely anonymous. You are not to write down your name on the survey. Thus, it will not be possible to match your name to your questionnaire. Your data will be treated with complete confidentiality and will be stored in a safe and secure location at Bond University for a period of five years in accordance with the guidelines set out by the Bond University Human Research Ethics Committee. Data will not be made accessible to any person outside of the Bond University researchers working on the project. Participation in the study is completely voluntary and you may withdraw at any time without any penalty imposed.

If you experience distress from participation in this research, please contact Bond University Counselling Service located at the Bond University Staff and Student Medical Clinic or Life Line on 13 11 64.

Should you have any complaints concerning the manner in which this research is being conducted, please make contact with Bond University Human Research Ethics Committee, c/o Bond University Office of Research Services, Bond University, Gold Coast, 4229. Tel: + 61 7 5595 4194 Fax: + 61 7 5595 1120 e-mail: buhrec@bond.edu.au Names and Signatures of participating researchers:

.....
Professor Chris Dubelaar

.....
Dr. Natalina Zlatevska

.....
Marcus Chee Tiong Tan

Please answer all questions in below.

QUESTION 1:

Please rate how much does each of the following factors influence your choice of holiday destinations:

	1 Very slightly or not at all	2 A little	3 Moderately	4 Quite a bit	5 Extremely
Language	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Culture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Food	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Weather	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Security	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Currency rates	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cost of travel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cost of accomodation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recommendation from friends or relatives	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recommendation from travel agency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

QUESTION 2:

This scale consists of a number of words that describe different feelings and emotions. Read each item and indicate to what extent you have felt this way today. Use the following scale to record your answers.

	1 Very slightly or not at all	2 A little	3 Moderately	4 Quite a bit	5 Extremely
Interested	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Distressed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Excited	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Upset	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Strong	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Guilty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Scared	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hostile	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enthusiastic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Proud	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Irritable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Alert	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ashamed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inspired	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nervous	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Determined	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attentive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jittery	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Active	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Afraid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

QUESTION 3

The following scale examines how perception of social hierarchy influences choice of holiday destinations.

	1 Strongly Disagree	2 Disagree	3 Somewhat disagree	4 Neither agree or disagree	5 Somewhat agree	6 Agree	7 Strongly agree
I have a desire to increase my position in the social hierarchy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I want to raise my relative position to others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Getting to climb the social ladder is a priority for me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would like to be viewed as being of higher standing than others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

QUESTION 4

Below is a list of statements dealing with your general feelings about yourself.

Please indicate how much you agree or disagree with each of the following statements.

	Strongly Agree	Agree	Disagree	Strongly Disagree
On the whole, I am satisfied with myself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
At times, I think I am no good at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that I have a number of good qualities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am able to do things as well as most other people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel I do not have much to be proud of.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I certainly feel useless at times.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that I'm a person of worth, at least on an equal plane with others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I wish I could have more respect for myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
All in all, I am inclined to feel that I am a failure.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I take a positive attitude toward myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

QUESTION 5

The following scale examines how eating behaviour influences choice of holiday destinations:

	1 Never	2 Seldom	3 Sometimes	4 Often	5 Very often	Non-relevant
If you have put on weight, do you eat less than you usually do?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	1 Never	2 Seldom	3 Sometimes	4 Often	5 Very often	
Do you try to eat less at mealtimes than you would like to eat?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	1 Never	2 Seldom	3 Sometimes	4 Often	5 Very often	
How often do you refuse food or drink offered because you are concerned about your weight?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	1 Never	2 Seldom	3 Sometimes	4 Often	5 Very often	
Do you watch exactly what you eat?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	1 Never	2 Seldom	3 Sometimes	4 Often	5 Very often	
Do you deliberately eat foods that are slimming?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	1 Never	2 Seldom	3 Sometimes	4 Often	5 Very often	Non-relevant
When you have eaten too much, do you eat less than usual the following days?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	1 Never	2 Seldom	3 Sometimes	4 Often	5 Very often	
Do you deliberately eat less in order not to become heavier?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

	1 Never	2 Seldom	3 Sometimes	4 Often	5 Very often
How often do you try not to eat between meals because you are watching your weight?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	1 Never	2 Seldom	3 Sometimes	4 Often	5 Very often
How often in the evening do you try not to eat because you are watching your weight?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	1 Never	2 Seldom	3 Sometimes	4 Often	5 Very often
Do you take into account your weight with what you eat?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

QUESTION 6

The following scale examines how impulsiveness influences choice of holiday destinations.

	Rarely / Never	Occasionally	Often	Almost always / Always
I act "on impulse"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I act on the spur of the moment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I buy things on impulse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I make-up my mind quickly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do things without thinking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I spend or charge more than I earn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am happy-go-lucky	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

QUESTION 7

To assist us with future studies, we would like your feedback on your experience throughout the study:



QUESTION 8

Please rate the rapport level among the members in the group.

Rapport is a term used to describe the combination of qualities that emerge from an interaction. These interactions are characterized by such statements as "we really clicked" or "we experienced real chemistry."

When you come away from a conversation that was 2 hours long and you feel invigorated, you have experienced an interaction high in rapport. Terms like engrossing, friendly, harmonious, involving, and worthwhile describe interactions high in rapport.

	1 No rapport	2	3	4	5	6	7	8 High rapport
Rapport among all members	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Question 9

How comfortable were you interacting with the other participants?

	1 Not at all	2	3	4	5	6	7	8	9	10	11 Extremely
To what degree did the interaction seem awkward, forced, and strained to you?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How self-conscious did you feel when you were with the other participants?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To what degree did the interaction seem smooth, natural, and relaxed to you?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How comfortable did you feel when you were with the other participants?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Question 10

Please indicate how well you knew the other 3 participants prior to this survey

	Did not know	Acquaintance	Knew well	Knew very well
Participant sat in front of you	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participant sat on your left	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participant sat on your right	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

QUESTION 11

During the study, did you notice anyone sharing their food?

- ☐ Yes
- ☐ No

QUESTION 12

Your gender

- ☐ Male
- ☐ Female

QUESTION 13

Your country of origin

QUESTION 14

How long have you been living in Australia?

Years

QUESTION 15

Is English your first language?

- ☐ Yes
- ☐ No

Question 16

Your height?

- ☐ Answer in cm (centimetres)
- ☐ Answer in feet and inches

Question 16

Please enter your height in cm (centimetres)

cm

Question 16

Please enter your height in feet and inches

feet

inches

Question 17

Your Weight?

Weight in KG

**Thank you very much for your
participation!**

**Please click "next" to end this
survey.**